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CURTIS'S
BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

D. PRAIN, C.I.E., LL.D., F.R.S.
DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. V.

OF THE FOURTH SERIES.

(*Or Vol. CXXXV. of the Whole Work.*)

And all rare blossoms from every clime
Grew in that garden in perfect prime.
SHELLEY.

LONDON:
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To

F. W. MOORE, Esq., M.A., A.L.S., V.M.H.,

KEEPER OF THE ROYAL BOTANIC GARDEN, GLASNEVIN,

WHOSE SYMPATHY WITH

THE BOTANICAL MAGAZINE

IS PRACTICALLY MANIFESTED IN

THE READY CONTRIBUTION

OF INTERESTING SUBJECTS,

THIS VOLUME

IS CORDIALLY DEDICATED.

Royal Botanic Gardens, Kew,
Dec. 1, 1909.

INDEX

To Vol. V. of the Fourth Series, or Vol. CXXXV. of the whole Work.

8271 Agave Wrightii.
8263 Aloe rubrolutea.
8237 Alpinia bracteata.
8233 Angadenia nitida.
8251 Anthurium trinerve.
8272 Aphelandra tetragona.
8249 Arbutus Menziesii.
8288 Asparagus tetragonus.
8258 Begonia modica.
8281 Bulbophyllum campanulatum.
8267 Caralluma Nebrownii.
8285 Cephalotaxus drupacea.
8277 Cereus amecamensis.
8278 Cissus adenopodus.
8235 Clerodendron ugandense.
8262 Coelogyne venusta.
8261 Cornus macrophylla.
8284 Cotoneaster moupinensis, *forma* floribunda.
8242 Cycas Micholitzii.
8268 Cynoches densiflorum.
8252 Dendrobium Bronckartii.
8255 Deutzia setchuenensis.
8232 Encephalartos Barteri.
8239 Eranthemum Wattii.
8234 Eria rhynchostyloides.
8269 Erlangea tomentosa.
8275 Euphorbia Ledienii.
8291 Euryops virgineus.
8274 Exostemma subcordatum.
8247 Impatiens Hawkeri.
8286 Kitchingia uniflora.
8253 Larix occidentalis.
8279 Laurelia serrata.
8236 Lonicera Giraldii.
8282 Magnolia Delavayi.
8266 Mahonia arguta.
8273 Megaclinium purpureorachis.
8248 Microloma tenuifolium.
8254 Mussaenda Treutleri.
8245 Nigella integrifolia.
8238 Oligobotrya Henryi.
8290 Opuntia imbricata.
8287 Parthenocissus tricuspidata.
8276 Peliosanthes violacea, *var.* Clarkei.
8283 Pieris formosa.
8240 Pinus Bungeana.
8257 ,, Jeffreyi.
8260 Prunus japonica.
8289 ,, maritima.
8244 Pseuderanthemum seticalyx.
8256 Pyrus Pashia, *var.* Kumaoni.
8265 ,, Ringo.
8280 Rhododendron coombense.
8264 Rubus canadensis.
8246 ,, Koehneanus.
8243 Saxifraga scardica.
8259 Sorbus cuspidata.
8241 ,, Vilmorini.
8270 Spiraea Henryi.
8250 Strophanthus Preussii.

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1679

Tab. 8287.

PARTHENOCISSUS tricuspidata.

Japan and China.

Ampelidaceae.

Parthenocissus, *Planch. in DC. Monogr. Phanerog.* 1887, vol. v. p. 447.—Vitis, *Benth. et Hook. f. Gen. Plant.* vol. i. p. 387, *partim*; *non* Linn.

Parthenocissus tricuspidata, *Planch. in DC. Monogr. Phanerog.* vol. v. p. 452; species cirrhis brevibus ramosis discigeris, foliis subtus fere glabris polymorphis nunc parvis indivisis nunc majoribus tricuspidatis rarius trifoliolatis plerumque grosse crenato-serratis insignis.

Frutex scandens, ramosissimus, heterophyllus, muris arborumque cortice arcte adhaerens, cirrhis brevibus ramosis oppositifoliis apicibus in discos facie interiore viscosos expansis; ramuli longi, polyphylli, et breves diphylli foliis suboppositis. *Folia* basi cordata, 5-nervia, grossiuscule crenato-serrata dentibus plerumque rotundatis mucronatis rarius acutis, supra nitida, glabra, subtus in nervis parce minute pilosa, ceterum glabra; folia superiora ramulorum longorum parva, circumscriptione ovata, indivisa vel leviter tricuspidata tantum, inferiora et folia ramulorum brevium magna—ad 25 cm. usque diametro, longe petiolata, circumscriptione suborbicularia, conspicue tricuspidata, rarius trifoliolata: in plantis juvenilibus folia majora plerumque trifoliolata; stipulae lanceolatae, membranaceae, deciduae. *Cymae* plerumque e ramulis brevibus ortae, interdum singulae, axillares, versus basin ramulorum longorum dispositae; ramuli breves cirrho mon deciduo vel cyma aphylla terminati, nunc cymam in quaque axilla gerentes. cyma inferiore aphylla, superiore foliata, nunc cymam in axilla inferiore et ramulum longum in axilla superiore, nunc gemmam in axilla inferiore et cymam in axilla superiore gerentes; bracteae membranaceae; flores viriduli. *Calyx* cupularis fere truncatus. *Petala* 5, induplicato-valvata, apice uncato-inflexa, anthesi patentia marginibus inflexis, ovato-oblonga, circiter 4 mm. longa. *Stamina* erecta, petalis opposita; antherae introrsae, dorso glanduligerae. *Discus* ovarii dimidio inferiore adnatus, 5-sulcatus, glandularis. *Ovarium* 2-loculare; ovula pro loculo 2, collateralia, erecta; stylus vix 1·5 mm. longus stigmate inconspicuo. *Bacca* pruinosa, 1–2-sperma.—*P. Veitchii*, Graebn. in Gartenfl. 1900, vol. xlix. p. 249. *Ampelopsis tricuspidata*, Sieb. et Zucc. Fl. Jap. 1846, p. 88. *A. Roylei*, Kirchn. Arb. Musc. 1864, p. 152. *A. Veitchii*, Hort. ex Gard. Chron. 1868, p. 814. *A. japonica*, Hort. ex Gard. Chron. 1868, p. 1118. *Cissus Thunbergii*, Sieb. et Zucc. Fl. Jap. 1846, p. 87. *C. Veitchii*, Carrière in Rev. Hortic. 1877, p. 176. *Vitis inconstans*, Miq. in Ann. Mus. Bot. Lugd.-Bat. 1856, vol. i. p. 91. *V. capreolata*, K. Koch Dendrol. 1869, vol. i. p. 556; nec Don. *V. Veitchii* et *V. tricuspidata*, Lynch in Journ. Linn. Soc. Bot. 1879, vol. xvii. p. 308. *V. japonica*, Hort ex Nichols. Dict. Gard. 1884, vol. i. p. 66; nec Thunb. *Quinaria tricuspidata*, et *Q. Veitchii*, Koehne in Gartenfl. 1892, vol. xli. p. 403. *Psedera tricuspidata*, Rehder in Rhodora, 1908, vol. x. p. 29.—T. A. Sprague.

December, 1909.

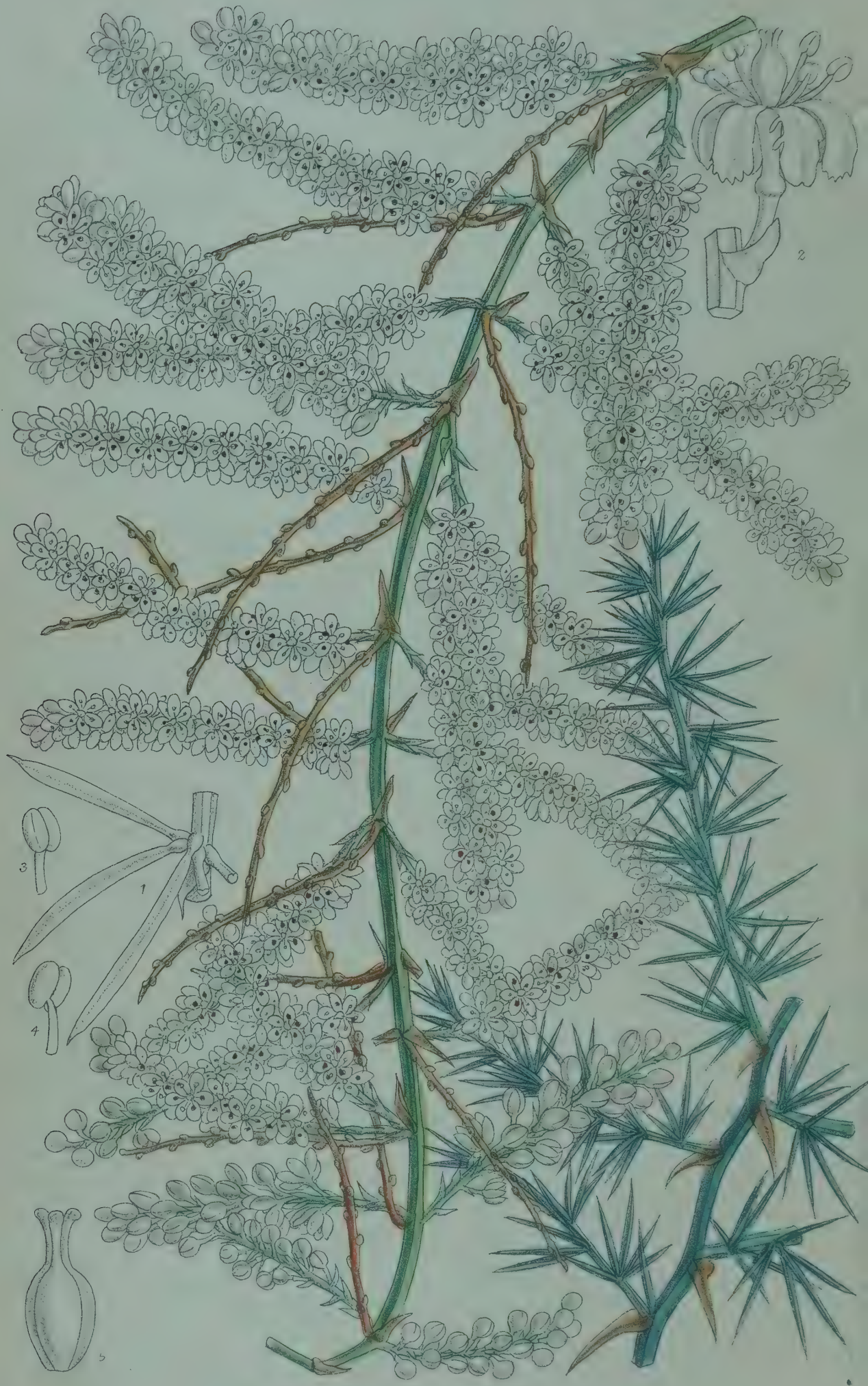
No climbing plant ever introduced to Great Britain is more generally cultivated than the subject of our plate. Supporting itself on walls without artificial aid, by the viscous at first capitate but ultimately disk-like tips of its tendrils, it gives little trouble to grow, and is now more frequently planted as a creeper on town and suburban houses even than the Ivy. The leaves acquire the most beautiful of autumn tints, and, being deciduous, do not produce the dark winter effect that in some places renders Ivy unsuitable. Nearly allied to the familiar Virginian Creeper, *Parthenocissus quinquefolia*, which also has viscous tendril-tips, the plant here figured, when brought into general cultivation in 1868 by Messrs. J. Veitch and Sons, was distributed as *Ampelopsis Veitchii* and *A. japonica*. Quite recently, authorities so careful as Koehne and Graebner have once more endeavoured to discriminate between these two plants, but it is generally conceded that they represent no more than two states of a single species for which the most familiar garden name is *Ampelopsis Veitchii*. In works which accept the view enunciated in the Genera Plantarum, where the genus *Vitis* is made to include all the Ampelidaceae except the species of *Pterisanthes* and of *Leea*, our plant is known as *Vitis inconstans*, a name which is, however, somewhat less familiar than that under which it was issued by the Messrs. Veitch. But this view is now almost universally considered too comprehensive, and writers who, like Mr. Sprague, follow the careful monograph by Planchon, where the *Vitis* of the Genera Plantarum is subdivided into nine distinct genera, are precluded from using either of these familiar names. Our plant is neither a *Vitis*, in the narrower sense in which that name was originally and is now again more satisfactorily employed, nor a genuine *Ampelopsis*; it is a member of the genus which Planchon has termed *Parthenocissus*, readily distinguishable from the other genera of Ampelidaceae grown out of doors in this country by having viscous tendril-tips, by the absence of tendrils from the inflorescence, and by the glandular hypogynous disk being entirely adnate to the ovary. *P. tricuspidata* has shoots of two distinct kinds—long shoots and short. The long shoots bear several leaves with leaf-opposed tendrils and axillary branchlets, two successive leaves having a tendril opposite

to them, and the third a branchlet in its axil. The short shoots produce only two leaves in each year; these leaves are nearly opposite, and each has a branch or bud in its axil; the shoot itself may end either in a tendril, which soon disappears, or in a cyme. Three combinations are met with as regards the axillary branches. There may be a cyme in each axil; or there may be a cyme in the axil of the lower and a long shoot in that of the upper leaf; or, finally, there may be a vegetative bud in the lower axil, which will continue the growth of the short shoot in the following season, and a cyme in the upper. Trifoliolate leaves are characteristic of young plants; in this condition *P. tricuspidata* bears a superficial resemblance to the juvenile state of the Poison Ivy, *Rhus Toxicodendron*, and recently a good deal of unnecessary alarm has been caused by the confusion of the two in a popular article. The plant now figured is quite harmless, and is readily distinguished by its leaves being mostly simple; the *Rhus* never has simple leaves. *P. tricuspidata* is most easily cultivated, and will thrive in almost any soil. Propagation is effected by means of cuttings placed in gentle heat. The young plants should be grown in pots until planted out in permanence, as they do not transplant well.

Description.—*Shrub*, climbing by means of short, much-branched, leaf-opposed tendrils with discoid viscous tips; twigs of two kinds, long with several leaves and short with 2 nearly opposite leaves. *Leaves* polymorphic, cordate and 5-nerved at the base, rather coarsely crenate-serrate, the teeth usually rounded, mucronate, less often acute, glabrous and shining above, finely puberulous on the nerves beneath, those of the long shoots mostly small, ovate, entire or slightly 3-cuspidate; the lower leaves of long shoots and those of the short shoots much larger, up to 10 in. long, with long petioles, nearly orbicular, markedly 3-lobed or occasionally 3-foliolate, in young plants still larger and usually 3-foliolate; stipules lanceolate, membranous, deciduous. *Cymes* mostly from the short shoots, some also from low down on the long shoots, their arrangement regulated by the mode of growth which is sympodial at two succeeding nodes and monopodial at the third; bracts membranous; flowers greenish. *Calyx* cup-shaped, somewhat

truncate. *Petals* 5, induplicate-valvate, inflexed at the tip, spreading in flower, with inturned margins, ovate-oblong, about 2 lin. long. *Stamens* erect, opposite the petals; anthers introrse, glandular on the back. *Disk* adnate to lower half of ovary, 5-grooved, glandular. *Ovary* 2-celled, cells 2-ovuled; ovules collateral, erect; style less than 1 lin. long, stigma minute. *Berry* pruinose, 1–2-seeded.

Fig. 1, a branched tendril; 2, flowers; 3 and 4, stamens; 5, pistil:—*all enlarged.*



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TAB. 8288.

ASPARAGUS TETRAGONUS.

South Africa.

LILIACEAE. Tribe ASPARAGEAE.

ASPARAGUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 765.

Asparagus tetragonus, *Bresler, Gen. Aspar. Hist.* No. 15; *Schult. f. Syst. Veg.* vol. vii. p. 329; species ex affinitate *A. racemosi*, Willd., cladodiis brevioribus perianthii segmentis obtusis exterioribus apice eroso-laciniatis differt.

Suffrutex sarmentosus. *Radix* tuberis pluribus translucentibus ellipticis 3 cm. longis, 1·5 cm. latis instructa. *Caulis* teres, aculeis decurvis robustis lignosis 12 mm. longis instructus; ramuli acute triangulares, recti, angulis scabris. *Cladodia* saepius quinatim fasciculata, trigona vel tetragona, linearia, 14 mm. longa, mucronata, basi incrassata. *Racemi* plures, 6 cm. longi, patentes; bracteae 1·5 mm. longae, membranaceae, brunneae; pedicelli 3 mm. longi, infra medium articulati. *Perianthii* segmenta obovata, 3 mm. longa, alba, obtusa, exteriora eroso-laciniata, interiora obscure dentata. *Stamina* quam perianthium paullo breviora; antherae 0·4 mm. longae, obtusae, dilute roseae. *Ovarium* ampullaeforme; stylus brevis, crassus, trilobatus. *Bacca* globosa, 6 mm. in diametro, coccinea.—*A. racemosus*, var. *tetragona*, Baker in Journ. Linn. Soc. vol. xiv. p. 624, et in Dyer, Fl. Cap. vol. vi. p. 269.—C. H. WRIGHT.

Asparagus tetragonus is a member of the group of species of which *A. racemosus*, Willd., is the best known example. The general resemblance between these two species is considerable, and it has even been suggested that the subject of our plate may be no more than a variety of Willdenow's species, which is a native of Tropical Asia and Africa. But *A. tetragonus*, which is a native of South Africa, and was first collected by Mund and Maire in Cape Colony, has broader perianth segments, the outer ones at least being almost laciniate, than is the case in *A. racemosus* where the perianth segments are oblanceolate, somewhat acute, and quite entire. The spines of the two species also differ somewhat, those of *A. tetragonus* being stout and decurved, whereas those of *A. racemosus* are often straight and slender. In both species the cladodia vary considerably; in the case of *A. tetragonus* some are compressed with a thick prominent rib on both faces and others are distinctly

trigonous; the majority, however, are almost equally tetragonous. The plant from which the figure now given has been prepared is one that has been grown for many years in the Succulent House at Kew, where, planted in a shallow border, its stems attain a length of over 10 ft. These are woody at the base and armed with rather formidable spines. The flowers, which are produced freely in autumn and are very fragrant, are succeeded by red globose one-seeded berries. Like some allied species, *A. tetragonus* has a root system remarkable for the large, whitish, watery, ovate tubers which are formed along the principal roots, and are calculated to enable the plant to endure prolonged periods of drought. *A. tetragonus* is not difficult to grow, and is a useful plant for clothing pillars in a conservatory.

Description. — *Undershrub*, climbing; roots bearing numerous translucent, elliptic tubers, $1\frac{1}{4}$ in. long, $\frac{2}{3}$ in. thick. *Stem* cylindric, armed with stout decurved woody thorns, 6 lin. long; twigs sharply triangular, straight, their angles scabrid. *Cladodes* usually in fascicles of 5, 3- or 4-angled, linear, 7 lin. long, mucronate, their bases thickened. *Racemes* rather numerous, $2\frac{1}{2}$ in. long, spreading; bracts under 1 lin. long, membranous, brown; pedicels $1\frac{1}{2}$ lin. long, jointed below the middle. *Perianth-segments* obovate, $1\frac{1}{2}$ lin. long, white, obtuse, the outer distinctly erosely lobulate, the inner faintly toothed. *Stamens* rather shorter than the perianth; anthers under $\frac{1}{2}$ lin. long, obtuse, faintly rose-coloured. *Ovary* subglobose; style short, thick, 3-lobed. *Berry* globose, 3 lin. broad, pink.

Fig. 1, fascicle of cladodes; 2, a flower; 3 and 4, stamens; 5, pistil:—*all enlarged.*

TAB. 8289.

PRUNUS MARITIMA.

Eastern North America.

ROSACEAE. Tribe PRUNEAE.

PRUNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus (Euprunus) **maritima**, *Wangenh. Am.* 1781, p. 103; *Britton et Brown, Ill. Fl.* vol. ii. p. 249; *Bailey, Cycl. Am. Hort.* 1449; *Schneider, Ill. Handb. Laubholzk.* vol. i. p. 624; affinis *P. Gravesii*, Small, a qua foliorum forma et putamine utrinque acuto vel subacuto differt.

Frutex ad 3 m. usque altus, ramis primariis decumbentibus, secundariis erectis vel suberectis, cortice plus minusve cinereo glabro. *Folia* elliptica vel obovata, basi plus minusve cuneata vel leviter rotundata, apice plerumque subacuta, 4–7 cm. longa, 2–3·5 cm. lata, serrata, utrinque pubescentia vel glabra, nervis utrinque 6–8 subtus elevatis; petioli usque ad 8 mm. longi, breviter pubescentes; stipulae oblongae, ciliatae, deciduae. *Corymbae* breves, usque ad 10-florae; pedicelli circiter 1 cm. longi, pubescentes. *Receptaculum* fere campanulatum, 2·5 mm. longum, extus breviter pubescens, intus glabrum. *Calycis* segmenta ovata, apice rotundata, 1·5 mm. longa, utrinque pubescentia, marginibus inflexis. *Petala* alba, latissime obovata vel suborbicularia, 6–7 mm. longa, 5–6 mm. lata, superne crenata. *Stamina* 18–25; filamenta subaequalia. *Carpellum* ellipsoideum, glabrum; stylus robustus, 3·5 mm. longus, glaber, apice minute bifidus. *Drupa* oblongo-ellipsoidea vel subglobosa, vix 2 cm. longa, rubro-purpurea, putamine utrinque acuto vel subacuto.—*P. sphaerocarpa*, Michx Fl. Bor. Am. vol. i. p. 284. *P. pubescens*, Poir. in Lamk Encyc. Meth. Suppl. vol. iv. p. 584. *P. littoralis*, Bigel. Fl. Bost. ed. 2, vol. ii. p. 193.—J. HUTCHINSON.

The Shore Plum, here figured, occurs on the sands of the Atlantic sea-shore from New Brunswick to Virginia, and is also met with at the head of Lake Michigan. Chapman indeed (Flora of the Southern United States, ed. 3, p. 131) records it from Alabama; the basis of this record is, however, a very imperfect specimen collected by Buckley in the Alleghany Mountains, and Sargent (Sylva of North America, vol. iv. p. 28) is probably justified in concluding that, as no other trace of *P. maritima* has been met with in this now well-explored region, the specimen obtained by Buckley merely represents a form of *P. alleghaniensis*, Porter. The nearest ally of *P. maritima* is *P. Gravesii*,

Small, from which our plant appears to differ mainly in the shape of the leaves and in having a stone which is more or less pointed at both extremities. The plant from which our figure has been prepared has long existed in the Kew collection. It flowers in May, and not only produces its blossoms in great profusion, but keeps them in perfection longer than most Plums do. At Kew it forms a low spreading bush, 4–5 ft. high, and considerably more in width. Judging by the localities in which it grows wild, it ought to prove useful for planting in fairly exposed places near the sea. It appears to possess a very robust constitution, and is one of the most accommodating of American Plums in regard to soil. It is, however, rather subject to attack by the aphis which so frequently infects the young shoots of Plums and causes the leaves to curl up into shapeless masses. *P. maritima* produces its fruit in sufficient quantity to afford ample means of propagation; it can also be budded on ordinary plum-stocks.

Description.—*Shrub*, 4–5 ft. high in cultivated specimens, reaching 12 ft. in wild specimens; main branches decumbent, the secondary erect or nearly so; bark smooth, more or less ash-grey. *Leaves* elliptic or obovate, more or less cuneate or somewhat rounded at the base, acute or subacute at the tip, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, serrate, pubescent or glabrous, nerves 6–8 on each side, raised beneath; petiole 4 lin. long or less, finely pubescent; stipules oblong, ciliate, deciduous. *Corymbs* short, 10- or fewer-flowered; pedicels about 5 lin. long, pubescent. *Receptacle* almost campanulate, $1\frac{1}{2}$ lin. long, slightly pubescent outside, glabrous within. *Calyx-lobes* ovate, rounded at the tip, under 1 lin. long, with inflexed edges, pubescent on both sides. *Petals* white, wide obovate or nearly orbicular, 3–$3\frac{1}{2}$ lin. long, $2\frac{1}{2}$–3 lin. broad, crenate at the tip. *Stamens* 18–25, their filaments nearly equal. *Carpel* ellipsoid, glabrous; style stout, nearly 2 lin. long, glabrous, slightly 2-fid at the tip. *Drupe* oblong, ellipsoid, or nearly globose, about 10 lin. long, red-purple; stone more or less pointed at both ends.

Fig. 1, base of leaf and stipules; 2, section of a flower, the petals removed; 3, petal; 4 and 5, stamens; 6, stone of the fruit;—*all except* 6 *enlarged.*

2

1

M. S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith.

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TAB. 8290.

OPUNTIA IMBRICATA.

Mexico and South-western United States.

CACTACEAE. Tribe OPUNTIEAE.

OPUNTIA, *Mill.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 851.

Opuntia imbricata, *DC. Prodr.* vol. iii. p. 471; *K. Schum. Monogr. Cact.* p. 668; species ex affinitate *O. tunicatae,* Link et Otto, sed elatior et ab ea spinis numerosioribus brevioribus floribusque kermesino-purpureis valde diversa.

Frutex 1–2 m. altus vel *arbor* 3–4 m. alta, trunco 12–25 cm. crasso. *Rami* verticillati, patentissimi vel adscendentes; ramuli 4–16 cm. longi, 2–3 cm. crassi, cylindrici, glaucescenti-virides, tuberculati tuberculis costas breves 1·5–3·5 cm. longas compressas formantibus. *Pulvilli* depressi, breviter tomentosi. *Folia* teretia, patula, 1·2–2 cm. longa. *Aculei* 8–30, stellatim divaricati, 6–20 (raro 25–30) mm. longi, cornei vel fusci, vaginis arcte vestiti, 1–8 interiores longiores. *Flores* 5–7·5 cm. diametro, kermesino-purpurei. *Ovarium* 20–25-tuberculatum, superne parce foliosum; pulvilli setis paucis deciduis instructi. *Sepala* 8–13, obovata, obtusa vel retusa, viridia, purpureo-marginata. *Petala* 10–12, 2-seriata, obtusa vel retusa, breviter vel brevissime apiculata, kermesino-purpurea. *Stamina* numerosissima; filamenta purpurea; antherae luteae. *Stigmata* 8–10, lutea. *Fructus* subglobosus vel hemisphaericus, apice planus vel depressus, circiter 2·5 cm. diametro, tuberculatus, inermis, luteus.—*O. rosea,* DC. Prodr. vol. iii. p. 471; Mem. Mus. Hist. Nat. vol. xvii. p. 66, t. 15; Pfeiff. Enum. Diagn. Cact. p. 171; Foerst. Handb. Cact. ed. 2, p. 986, fig. 134. *O. arborescens,* Engelm. Bot. Wislez. Exped. p. 6; Pacif. Rail. Rep. vol. iv. pp. 51 et 58, t. 17, fig. 5, 6: t. 18, fig. 4: t. 24, fig. 12: t. 75, fig. 16, 17; Foerst. Handb. Cact. ed. 2, p. 984. *O. stellata,* Salm Dyck, Hort. Dyck. pp. 50 et 250; Engelm. in Bost. Journ. Nat. Hist. vol. vi. p. 208 (sub *O. arborescente*). *Cereus imbricatus,* Haw. Rev. Pl. Succ. p. 70.—N. E. BROWN.

Opuntia imbricata is a native of the dry interior of Central and Northern Mexico and of the adjacent regions to the north; its range extends through Arizona, New Mexico and Western Texas as far north as Pikes Peak in Colorado. For the material from which the figure now given has been prepared we are indebted to Sir E. G. Loder, Bart., in whose collection at Leonardslee, Horsham, a plant which he had himself collected in Colorado in 1878 flowered early in August, 1908. This species is a member of a small group of Opuntias characterised by their cylindric

stems with short ridge-like compressed tubercles and by the sheaths that cover their spines. It is the commonest member of the group to which it belongs in European gardens, and was first introduced to cultivation in the earlier years of the nineteenth century. In spite of this, however, it is a plant whose flowers, which are very attractive but which will only expand under the influence of direct sunshine and unfortunately do not last long, are not often seen in the United Kingdom. Sir Edmund Loder informs us that his example at Leonardslee has but seldom flowered; when it did so in 1908 this happened during a time of very hot, sunny weather, and individual flowers only remained fully open during one afternoon, from about midday till sunset.

Description.—*Shrub*, 3–7 ft. or a small tree up to 15 ft. high, its trunk 5–10 in. thick with whorled spreading or ascending branches; twigs 2–10 in. long, about 1 in. thick, cylindric, glaucous green, covered with compressed tubercular ribs $\frac{3}{4}$–$1\frac{1}{2}$ in. long; leaves terete, spreading, $\frac{1}{2}$–$\frac{3}{4}$ in. long; spine-bearing cushions depressed, shortly tomentose; spines in clusters of 8–30, stellately spreading, 3–10 (rarely 12–15) lin. long, grey or tawny, closely sheath-clad, the inner 1–8 longer than the others. *Flowers* 2–3 in. across, bright purple. *Ovary* with 20–25 tubercles, sparingly leafy in the upper part; the cushions bearing numerous deciduous bristles. *Sepals* 8–13, obovate, obtuse or retuse, green with purple edges. *Petals* 10–12, in two rows, obtuse or retuse, shortly or very shortly apiculate, bright purple. *Stamens* very many; filaments purple; anthers yellow. *Stigmas* 8–10, yellow. *Fruit* sub-globose or hemispheric, the top flat or depressed, about 1 in. across, yellow, tubercled but without spines.

Fig. 1, cluster of spines; 2, stigmas:—*both enlarged.*

M.S. del. J.N. Fitch lith

Vincent Brooks, Day & Son Lith

L. Reeve & Co. London

Tab. 8291.

EURYOPS virgineus.

South Africa.

Compositae. Tribe Senecionideae.

Euryops, *Cass.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 452.

Euryops virgineus, *Less. Syn. Comp.* p. 394; *DC. Prodr.* vol. vi. p. 445; *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 411; affinis *E. algoensi,* DC., sed capitulis minoribus achaeniisque glabris differt.

Frutex virgatus, 30–60 cm. altus, ramis teretibus glabris flavo-viridibus; ramuli floriferi circiter 10 cm. longi. *Folia* viridia, cuneata, alte 3–5-lobulata, 0·5–1 cm. longa, ad 0·5 cm. usque lata, coriacea, glabra. *Capitula* solitaria, axillaria, subcorymbosa, post anthesin racemosa, 1·5 cm. diametro; pedunculi erecti, graciles, ad 2·5 cm. usque longi, glabri; involucri bracteae basi connatae, ovato-lanceolatae, acutae, 2–4 mm. longae, membranaceae, glabrae, trinerviae. *Flores radii* 6, flavi; tubus 1 mm. longus, glaber; limbus oblongus, 6 mm. longus, 2–2·5 mm. latus, apice tridentatus. *Flores disci* superne campanulati, lobis triangularibus obtusis. *Antherae* appendiculatae, 1 mm. longae. *Achaenia* subteretia, glabra; pappi setae albae, patentes; styli rami 1 mm. longi.—*E. flabelliformis,* Cass. in Dict. Sc. Nat. vol. xvi. p. 51. *Othonna virginea,* Linn. f. Suppl. p. 309; Thunb. Prod. Pl. Cap. p. 168.—J. Hutchinson.

The genus *Euryops* includes, so far as it is at present known, some 40 species, all of which are confined to the African Continent and the island of Socotra. It is nearly allied to the genera *Senecio,* Linn., and *Othonna,* Linn.; from the former *Euryops* only differs in having connate involucral bracts which are not provided with calcycine appendages; from the latter it is distinguished by the fact that the florets of the disk are fertile. Most of the species of *Euryops* have thick fleshy leaves. The species now figured is a native of the coast region of Cape Colony, where it is found on stony veldt from Knysna to Albany. It is nearly allied to *E. algoensis,* DC., a native of the same region which has larger leaves, villous achenes and fewer but larger flower-heads. *E. virgineus* was first introduced to English gardens about 1821, and can be successfully grown in sheltered situations in the south-western parts of Britain. The material from which our plate has

been prepared was communicated to Kew by Mr. T. A. Dorrien Smith, in whose garden at Tresco Abbey, Isles of Scilly, it thrives luxuriantly and flowers profusely in March and April.

Description.—*Shrub*, 1–2 ft. high, fastigiately branched, the branches cylindric, glabrous, yellowish green; flower-bearing twigs about 4 in. long. *Leaves* green, cuneate, deeply 3–5-lobulate, 3–5 lin. long, 2–2½ lin. broad, coriaceous, glabrous. *Heads* solitary, axillary, at first nearly corymbose, at length raceme-like, 8 lin. across; peduncles erect, slender, reaching 1 in. in length, glabrous; bracts of the involucre connate at the base, ovate-lanceolate, acute, 1–2 lin. long, membranous, glabrous, 3-nerved. *Ray-florets* 6, yellow; tube ½ lin. long, glabrous; limb oblong, 3 lin. long, 1–1½ lin. broad, the tip 3-toothed. *Disk-florets* campanulate above, with triangular obtuse lobes. *Anthers* appendaged, ½ lin. long. *Achenes* nearly terete, glabrous; pappus hairs white, spreading; style arms ½ lin. long.

Fig. 1, a leaf; 2, a flower-bud; 3, ray-floret; 4, disk-floret; 5, anthers; 6, pappus hair:—*all enlarged.*

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Fig. 1, a leaf; 2, a flower-bud; 3, ray-floret; 4, disk-floret; 5, anthers; 6, pappus hair:—*all enlarged*.

Tab. 8307.

TYPHONODORUM Lindleyanum.

Madagascar.

ARACEAE.

TYPHONODORUM, *Schott*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 977.

Typhonodorum Lindleyanum, *Schott in Oest. Bot. Wochenbl.* 1857, p. 70; *Gen. Aroid.* t. 43, et *Prodr.* p. 161; *Engl. in DC. Monogr. Phanerog.* vol. ii. p. 332; species unica.

Planta robusta, glabra, caule 1–3 m. alto et 10–30 cm. crasso, fibrosis vaginarum vestigiis vestito. *Foliorum* petioli 0·60–1·30 m. longi, validi, teretes, supra leviter concavi vel carinati et in utroque latere carinae leviter concavo-canaliculati, longe vaginati; lamina 0·35–1·05 m. longa, 18–60 cm. lata, ovata, acuta vel subacuminata, basi profunde cordata vel sagittata, lobis basalibus rotundatis vel deltoideis obtusis sinu triangulari aperto sejunctis. *Pedunculus* petiolo brevior, teres, 2·5–4 cm. crassus, viridis. *Spatha* suberecta, 40–60 cm. longa; tubus 8–13 cm. longus, oblongus, viridis; lamina 32–47 cm. longa, 8–13 cm. lata, lanceolata, acuminata, basi convoluta, superne explanata, undulata, utrinque flavida. *Spadix* 25–41 cm. longus; inflorescentia feminea 5–9 cm. longa, neutra 3–5 cm. longa, mascula fertilis 4–9 cm. longa, sterilis superior 13–18 cm. longa, flavo-aurantiaca. *Flores feminei* nudi, organis neutris paucis interdum commixti; ovarium ovoideum, 1-loculare, 1-ovulatum; stigma sessile 3–4-lobum; ovulum erectum, anatropum. *Flores masculi* nudi, inferiores antheris 4–8 in synandrium truncatum connatis, superiores steriles. *Baccae* magnae. *Semina* 2–2·5 cm. diametro, compresso-orbicularia.—*T. madagascariense*, Engl. Bot. Jahrb. vol. i. p. 188.—N. E. BROWN.

The gigantic evergreen Aroid which forms the subject of our illustration is a native of Madagascar, where it grows in water or in marshy places. It has, however, been introduced thence to the Island of Johanna in the Comoros, to Mauritius and it is also believed to Reunion, on account of its seeds which are eaten by the inhabitants. It develops an arboreous unbranched caudex crowned with a tuft of large sagittate leaves. The plant from which our drawing was made was presented to Kew in 1905 by the Royal Botanic Gardens, Dahlem, Berlin; placed in a bed of mud along with the Egyptian paper reed, it has grown vigorously and attained its present dimensions. It flowered at Kew for the first time in May, 1909, and afterwards developed ripe seeds, from which seedlings have been raised. Some of the seeds germinated in the bottom of the spathe.

APRIL, 1910.

DESCRIPTION.—*Shrub*, all parts glabrous. *Stem* stout, 3–10 ft. high, 4–12 in. thick, clothed with the fibrous remains of old leaf-sheaths. *Leaves* long-petioled; blade $1\frac{1}{4}$–$3\frac{1}{2}$ ft. long, 7 in. to 2 ft. across, ovate acute or almost acuminate, deeply cordate or sagittate, the basal lobes rounded or deltoid, obtuse, with a wide triangular sinus between; petiole stout, terete, long-sheathing, 2–$4\frac{1}{2}$ ft. long, slightly concave or keeled above and somewhat concavely channelled on either side of the keel. *Peduncle* shorter than the petiole, green, terete, 1–$1\frac{3}{4}$ in. thick. *Spathe* suberect, $1\frac{1}{2}$–2 ft. long; tube 3–5 in. long, oblong, green; blade 13–19 in. long, 3–5 in. across, lanceolate, acuminate, convolute below, somewhat flattened above, margins undulate, yellow on both faces. *Spadix* 10–16 in. long; female portion 2–$3\frac{1}{2}$ in. long, neuter $1\frac{1}{4}$–2 in. long, male fertile portion $1\frac{3}{4}$–$3\frac{1}{2}$ in. long, sterile upper portion $5\frac{1}{2}$–7 in. long, orange yellow. *Female flowers* naked, mixed at times with a few neuter flowers; ovary ovoid, 1-celled, 1-ovuled. *Male flowers* naked, the lower with 4–8 anthers connate in a truncate synandrium, the upper sterile. *Berry* large. *Seed* $1\frac{3}{4}$–2 in. across, flattened-orbicular.

Fig. 1, sketch of plant, showing habit; 2, leaf and apex of petiole; 3, inflorescence; 4, part of spadix; 5, three barren male flowers; 6, a fertile male flower; 7, two female flowers with a neuter organ between them; 8, longitudinal section of a female flower and a neuter organ; 9, transverse section of an ovary:—1–3 *reduced*, 4 *of natural size*, 5–9 *enlarged*.

T.S. del. J.N. Fitch lith.

TAB. 8308.

SAXIFRAGA GRISEBACHII.

South East Europe.

SAXIFRAGACEAE. Tribe SAXIFRAGEAE.

SAXIFRAGA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635.

Saxifraga (Kabschia) Grisebachii, *Degen et Dörfl. in Denkschr. Acad. Wiss. Wien.* vol. lxiv. p. 721; *Irving in Gard. Chron.* 1909, vol. xlvi. p. 195, fig. 81; affinis *S. Frederici-Augusti*, Bias., sed foliis basalibus majoribus confertis et patentibus differt.

Herba caespitosa, caudiculis brevibus dense foliosis; caules floriferi erecti, foliosi, 10–15 cm. alti, dense et patule glanduloso-pilosi. *Folia* inferiora imbricata, patula, sessilia, spathulato-lingulata, apice rotundato-mucronata, 0·5–2 cm. longa, 0·4–0·6 cm. lata, supra foveolis intramarginalibus numerosis, subtus carinata, margine cartilagineo versus basin parce ciliato; folia caulina patentia, oblongo-spathulata, circiter 1 cm. longa et 3 mm. lata, rubella, apice in mucronem viridem contracta, utrinque mucrone excepto dense glanduloso-pilosa. *Inflorescentia* racemosa vel subspicata; pedicelli bracteis multo breviores. *Calyx* rubro-purpureus, dense glanduloso-pilosus; lobi inaequales, oblongo-elliptici, apice rotundati, usque ad 6 mm. longi. *Petala* erecta, elliptico-lanceolata, purpurea, circiter 2 mm. longa, vix 1 mm. lata, inferne ciliata. *Stamina* petalis vix longiora.—J. HUTCHINSON.

The Saxifrage which forms the subject of our illustration is a native of the mountains of Albania and Central Macedonia. It was introduced into cultivation in 1902, in which year it received a first class certificate from the Royal Horticultural Society. It is a member of the section *Kabschia*, Engl., which includes three other species with red flowers and with somewhat similar foliage and habit, *S. Frederici-Augusti*, *S. media*, and the recently introduced *S. Stribrnyi*. From the first of these *S. Grisebachii* is readily distinguished by having larger and more spreading basal leaves. The two others differ from our plant mainly in having a branched inflorescence with distinctly pedicelled flowers. At Kew *S. Grisebachii* is grown in pots in a cold frame, and is transferred in March, when it comes into flower, to the Alpine House, where it continues in blossom for a month or more. When grown out of doors the plant, though quite hardy in other respects, is apt to suffer in winter from excess of moisture.

APRIL, 1910.

Description.—*Herb*, with short tufted densely leafy bases, the flowering stems erect, leafy, 4–6 in. high, rather densely beset with spreading glandular hairs. *Leaves* at the base imbricate, sessile, spathulate-ligulate, with rounded mucronate tips, 3–10 lin. long, 2–3 lin. wide, with numerous intramarginal pits on the upper side, keeled beneath, margin cartilaginous and sparingly ciliate near the base; stem-leaves spreading, oblong-spathulate, about 5 lin. long, under 2 lin. wide, reddish with an abruptly narrowed green tip, rather densely glandular hairy except at the tip. *Inflorescence* racemose or subspicate, the pedicels much shorter than the bracts. *Calyx* reddish-purple, densely glandular hairy; lobes unequal, oblong elliptic, rounded at the tip, the largest 3 lin. long. *Petals* erect, elliptic-lanceolate, purple, about 1 lin. long, barely half as wide, ciliate towards the middle and at the base. *Stamens* hardly exceeding the petals.

Fig. 1, a basal leaf; 2, a stem leaf; 3, a bract and flower; 4, flower; 5, petal; 6, stamen; 7, pistil:—*all enlarged.*

...der... N.Fitch lith.

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & C.o London.

Tab. 8309.

RHODODENDRON Harrovianum.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Harrovianum, *Hemsl. in Gard. Chron.* 1910, vol. xlvii. p. 4; species ex affinitate *R. heliolepidis*, Franch., a quo differt foliis angustioribus minus distincte apiculatis, corollae lobis acutis et staminibus exsertis.

Frutex 60–90 cm. altus; rami recti, rigidi, primum lepidoti, internodiis quam petiolis vix brevioribus. *Folia* sparsa, persistentia, coriacea, superiora patentia; lamina anguste lanceolata, 3–7 cm. longa, obscure apiculata, basi cuneata, margine recurva, supra atroviridia, nitida, laevia, costa impressa, subtus creberrime lepidota, lepidibus parvis, costa valida, elevata; petiolus crassiusculus 4–8 mm. longus. *Flores* 3–5 in ramorum apicibus aggregati, pedicellati, pedicellis crassiusculis, 1·5–2 cm. longis saturate rubris albo-lepidotis. *Calyx* brevissimus, obscure lobatus vel fere truncatus. *Corolla* campanulata, 2–2·5 cm. longa, lobis latis, extra parte inferiore saturate rubro-purpurea, albo-lepidota, lobis violaceo-purpureis, intus violaceo-purpurea, lobis superioribus flavo-maculatis. *Stamina* 10, exserta, alterna longiora, usque ad 3·5 cm. longa; filamenta supra basin et infra medium zona pilorum longorum patentium ornata. *Ovarium* 5-loculare, creberrime lepidotum; stylus glaber, cum ovario circiter 3–3·5 cm. longus. *Capsula* non visa.—W. Botting Hemsley.

The Rhododendron that forms the subject of our figure, which has been drawn from material supplied by Messrs. J. Veitch & Sons from a plant that flowered in their nursery at Coombe Wood in April, 1909, is one of the hardiest of the species newly introduced from China, where it was discovered by Mr. E. H. Wilson. All the plants now in cultivation have been raised from imported seeds, but judging by its appearance and by the behaviour of allied species, it is probable that its propagation by means of cuttings may be successfully accomplished. *R. Harrovianum*, which flowered at Coombe Wood for the first time in 1907, has grown well there under conditions adapted to Rhododendrons in general; a peaty, sandy soil and abundant moisture. In addition to *R. heliolepis*, Franch., to which, as Mr. Hemsley points out, it is nearly allied, our plant may also be compared with *R. coombense*, Hemsl., figured at

t. 8280 of this work, from which it differs in its longer leaves, its larger, violet-purple flowers, and its exserted stamens.

Description.—*Shrub*, 2–3 ft. high; branches straight, rigid, at first lepidote; internodes nearly as long as the petioles. *Leaves* scattered, persisting, coriaceous, the upper spreading; blade narrow lanceolate, $1\frac{1}{4}$–3 in. long, slightly apiculate, cuneate at the base, the margin recurved, dark green shining smooth and with the midrib sunk above, beneath closely lepidote with fine scales and with a stout raised midrib; petiole rather stout, 2–4 lin. long. *Flowers* pedicelled, in clusters of 3–5 at the tips of the branches; pedicels rather stout, $\frac{1}{2}$–$\frac{3}{4}$ in. long, reddish and dotted with white scales. *Calyx* very short, faintly lobed or almost truncate. *Corolla* campanulate, $\frac{3}{4}$–1 in. long, lobes broad, tube deep reddish-purple and dotted with white scales outside in the lower part, higher up like the lobes outside violet-purple, within corolla uniformly violet-purple save for yellowish blotches on the upper lobes. *Stamens* 10, exserted, alternately longer and shorter, the longest $1\frac{1}{2}$ in. in length, filaments with a band of longish spreading hairs above the base but below the middle. *Ovary* 5-celled, closely lepidote; including the quite glabrous style $1\frac{1}{4}$–$1\frac{1}{2}$ in. long. *Capsule* not seen.

Fig. 1, portion of underside of a leaf; 2, a scale from the same; 3, calyx and pistil; 4, scales from the ovary; 5 and 6, stamens of each series; 7, section of ovary:—*all enlarged.*

Vincent Brooks, Day & Son Lith. imp.

L. Reeve & Co. London

Tab. 8310.

DIPELTA floribunda.

China.

Caprifoliaceae. Tribe Lonicereae.

Dipelta, *Maxim. Bull. Acad. Pétersb.* vol. xxiv. (1878) p. 50, *quoad plantam floriferam tantum*; *Hemsl. in Gard. Chron.* 1908, vol. xliv. p. 101.

Dipelta floribunda, *Maxim. Bull. Acad. Pétersb.* vol. xxiv. p. 51, et *in Mél. Biol.* vol. x. p. 80; *Spooner in Gard. Chron.* 1907, vol. xlii. p. 2 cum figura; species typica, a *D. ventricosa*, Hemsl., imprimis bracteolis peltatis, corolla infra medium in tubum angustum constricta et corollae lobis longioribus distinguenda.

Frutex saepius 3–5 m. altus, habitu vultoque *Diervillae* specierum nonullarum, ramis elongatis graciliusculis primum puberulis, internodiis quam folia saepius brevioribus. *Folia* opposita, exstipulata, breviter petiolata, tenuia, decidua, lanceolata, ovato-lanceolata, vel ovata, saepius 5–10 cm. longa, acuminata, acuta, basi subcuneata vel rotundata, integra, primum puberula, demum glabrescentia, subtus pallidiora; venae primariae laterales utrinque circiter 4, primum pilosulae ultimis reticulatis pellucidis; petioli 3–6 mm. longi. *Flores* ad foliorum axillas fasciculati; pedunculi breves, saepius 2-foliati et 3–6-flori; pedicelli graciles, 1–1·5 cm. longi, puberuli. *Bracteae* lineares, puberulae, 7–10 mm. longae, cito deciduae. *Bracteolae* 6, valde difformes, nempe 2 minimae infra pedicelli medium positae, oppositae, cito deciduae; 4 persistentes, per anthesin accrescentes, demum scariosae, venosae, juxta ovarii basin enatae, confertae; 2 exteriores vel inferiores minores, inaequales, 1 antica, 1 postica; antica major, ovata, obtusa, basi lata, pedicellum amplexans, plene evoluta circiter 1·5 cm. longa; postica similis nisi minor, circiter 0·5 cm. longa; 2 interiores vel superiores majores, rotundato-oblongae, leviter obliquae, auriculaeformes, peltatae, 2–2·5 cm. diametro maximo, capsulam omnino occultantes. *Calycis* limbus ad basin 5-partitus; lobi subaequales, lineares, circiter 5 mm. longi, glandulosi, acutissimi, persistentes. *Corolla* albo-rosea, inflato-tubulosa, bilabiata, circiter 3 cm. longa; tubus infra medium constrictus, cylindricus; limbi lobi subaequales, rotundato-oblongi, patentes, circiter 1 cm. longi, labio inferiore intus striis aurantiacis ornato. *Stamina* 4, didynama, inclusa. *Ovarium* inferum, hirsutum, 4-loculare; loculi 2 fertiles, 1-ovulati; 2 steriles ovula plura imperfecta includentes; stylus filiformis, glaber, leviter exserta. *Fructus* (immaturus tantum visus) angulatus, lobis calycinis coronatus, circiter 1·5 cm. longus, intra bracteolas accrescentes occultatus.—W. Botting Hemsley.

The genus *Dipelta* has, owing to the absence of complete material, never hitherto been fully described. The late Mr. Maximowicz, by whom it was founded on specimens of the species here illustrated, could only report of the fruit, which

we now know to be a small dry capsule, concealed within the scarious accrescent bracteoles, as "said to be a red edible berry." Perfect seeds were sent to England in December, 1904, by Mr. E. H. Wilson to Messrs. J. Veitch & Sons, but none exist in the herbarium at Kew. These seeds, gathered at altitudes of from 6,500 to 8,000 ft. above sea level in Western China, were sown by Messrs. Veitch early in 1905, and produced plants from one of which came the material from which our figure has been prepared. Three other species of *Dipelta* have been described; *D. yunnanensis*, Franchet, *D. elegans*, Batalin, and *D. ventricosa*, Hemsl., all from Western China. In the herbarium at Kew there are specimens in fruit of yet another form discovered by Mr. A. Henry in Hupeh in Central China. This is noted by Henry as possibly a new species; it is a tree 10–40 ft. high, and has larger and much broader leaves than *D. floribunda*, to which it is most nearly allied, and of which the late Professor Batalin considered it to be a state. This doubtful form, like *D. yunnanensis* and *D. elegans*, is not yet in cultivation, but the herbarium material available does not indicate that any one of the three is superior as an ornamental plant to the species now figured, or to *D. ventricosa*, figured at t. 8294 of this work. In the nursery of Messrs. Veitch at Coombe Wood, *D. floribunda* forms a free-growing bush of rounded habit about 4 ft. high, bearing in general appearance a resemblance to one of the Bush Honeysuckles, or to a *Diervilla*. It requires a good, loamy soil and can be increased by cuttings. It is quite hardy, and flowers during May.

Description.—*Shrub* often 10–16 ft. high, in habit recalling some of the Diervillas; branches long, rather slender, at first puberulous; internodes mostly shorter than the leaves. *Leaves* opposite, without stipules, short-petioled, thin, deciduous, lanceolate, ovate-lanceolate, or ovate, often 2–4 in. long, acute and acuminate, somewhat cuneate or rounded at the base, entire, at first puberulous but soon glabrescent, rather paler on the underside; main nerves about 4 on each side, somewhat hairy at first, the fine reticulate venation translucent; petioles 2–3 lin. long. *Flowers* clustered in the leaf-axils; peduncles short, usually 2-leaved and 3–6-flowered; pedicels slender, 5–8 lin. long,

puberulous. *Bracts* linear, puberulous, 3–5 lin. long, soon disappearing. *Bracteoles* 6, dissimilar; the lowest pair below the middle of the pedicel very small, opposite, soon disappearing; the remaining four close-set near the base of the pistil, persistent, accrescent, ultimately scarious, strongly veined; of these the two outer or lower anterior and posterior, both smaller than the two inner or upper, but themselves unequal; the anterior lower ovate, obtuse, wide-based, embracing the pedicel and about 8 lin. long, the posterior similar but only about 3 lin. long; the two upper or inner rounded-oblong, slightly oblique, auriculaeform, peltate, $\frac{3}{4}$–1 in. across in the widest part when mature, and quite concealing the capsule. *Calyx* limb 5-partite, lobes nearly equal, linear, about $2\frac{1}{2}$ lin. long, glandular, very pointed, persistent. *Corolla* pale rose, inflated tubular, 2-lipped, about $1\frac{1}{4}$ in. long; tube narrowed below the middle, cylindric; lobes nearly equal, rounded-oblong, spreading, about 5 lin. long; lower lip marked with orange lines. *Stamens* 4, didynamous, included. *Ovary* inferior, hirsute, 4-celled, with 2 fertile 1-ovuled cells and 2 sterile cells with several imperfect ovules in each; style filiform, glabrous, somewhat exserted. *Fruit* (only seen unripe) angled, tipped by the persistent calyx lobes, about 8 lin. long, hidden by the accrescent bracteoles.

Fig. 1, peltate bracteoles, calyx and pistil; 2, the same with one peltate bracteole removed; 3, base of the corolla, laid open; 4, anther:—*all enlarged.*

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L. Reeve & Co. London

Tab. 8311.

CORNUS Nuttallii.

Western North America.

Cornaceae.

Cornus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 947.

Cornus Nuttallii, *Audubon, Birds of North Am.* ed. fol. el. (1837) t. 367 (nomen) et ed. norm. (1842), vol. iv. pp. 313, 315, t. 279; *Torr. & Gray, Fl. N. Am.* vol. i. p. 652; *Sargent, Silva N. Am.* vol. v. p. 69, t. 214; *Eastwood, Trees of California*, p. 73, t. 51; *C. K. Schneider, Ill. Handb. Laubholzk.* vol. ii. p. 454, fig. 31 h, m.; affinis *C. floridae*, Linn., sed elatior, foliis ad obovatum vergentibus vix vel breviter acuminatis subtus copiosius pilosis, involucro majore, bracteis abrupte apiculatis vel acuminatis distincta.

Frutex vel *arbor*, 15–24 m. alta, cortice griseo laevi, ramis nisi novellis glabris fuscis. *Folia* plerumque obovata vel obovato-elliptica, breviter vel obscure acuminata, 5–12 cm. longa, 4–9 cm. lata, supra primo adpresse pilosa, citissime glabrata, subtus canescentia, molliter pilosa vel villosula, nervis utrinque circiter 5; petioli 6–15 mm. longi. *Bracteae* involucrantes plerumque 6, obovatae, breviter apiculatae, rarius acuminatae, albidae, luteo- vel interdum rubro-suffusae, 4–8 cm. longae, 2·5–7 cm. latae. *Florum* capitula 1·4–2 cm. diametro; flores fertiles cum sterilibus mixti. *Calyx* extra adpresse griseo-pubescens. *Petala* viridi-albida. *Drupae* paucae perfectae inter abortivas minores numerosas, oblongae, rubrae, 8–12 mm. longae, apice calyce persistente nigrescente coronatae.—*Benthamia Nuttallii*, Nakai in Tokyo Bot. Mag. vol. xxiii. p. 41.—O. Stapf.

The subject of our plate is the noblest of the Cornels. It is met with on the Pacific coast of North America from British Columbia and Vancouver Island to Southern California, and is common on the Coast Mountains down to Monterey. In the most favourable conditions, and especially in the Redwood forests of Northern California, it attains a large size; one tree is recorded as reaching a height of 100 ft. Professor Sargent and Miss Eastwood speak of it as one of the most beautiful of trees, gorgeous in autumn with its red fruits and brilliantly coloured foliage; a recent writer in the Gardeners' Chronicle says that on this account the tree is spared even by the settler. The involucre, often loosely spoken of as the flower, is at times 6 in. across, with individual bracts $2\frac{3}{4}$ in. wide. The first botanist to discover

the species was Mr. David Douglas, about 1826; at that time it was believed to be only a form of *C. florida*, and it was not recognised as distinct till it was rediscovered by Mr. Thomas Nuttall, some ten years later, during a journey to the Pacific coast. In the 1837 elephant folio edition of the Birds of North America, which consists of plates only, t. 367 is devoted to *Columba fasciata*, with which is associated a branch of this Cornel. In the 1842 edition of the same work, which is accompanied by letterpress, Audubon explains his indebtedness to his friend Nuttall for the information that the berries of this hitherto uncharacterised tree form a staple food of this particular pigeon. In publishing the technical description added by Nuttall to his notes, Audubon took the opportunity to dedicate the species to his friend.

There is no indication that seeds of *C. Nuttallii* reached England at the time of its discovery by Douglas, but we learn from Audubon that on its rediscovery by Nuttall seeds were transmitted to Lord Ravensworth, and further, that information had reached America that these seeds had germinated. In spite, however, of its introduction seventy years ago, *C. Nuttallii* has never been common in this country, and it certainly is not so amenable to the artificial conditions of cultivation as most of the dwarfer Cornels are. During the spring of 1909, however, the species flowered at Kew, in the garden of Mr. B. E. C. Chambers at Haslemere, and with Messrs. Veitch & Sons at Coombe Wood. The Kew plant, from which our main figure has been made, was purchased from a French nurseryman in 1904, and is now 5 ft. high and quite healthy; during the past season it has made shoots 1 to 1½ ft. long. It is growing in a sandy loam to which some peat and decayed leaves have been added. Our experience with this Cornel has not been sufficiently prolonged to justify a dogmatic statement as to its treatment, but we should recommend for it a well-drained loamy soil abundantly reinforced with decayed leaves—the ordinary "leaf-soil" of the gardener, a sunny, sheltered position, and attention to the matter of watering whilst the plants are young and the root system is not extensive. A heavy cold soil is probably as ill-suited for it as a very dry sandy one. Perhaps the finest plant of *C. Nuttallii* in this country is one in the garden of Mr. Chambers, who supplied from it the fruit

depicted in our plate; it is a small tree, about 15 ft. high, with a single stem. Mr. Chambers informs us that he finds the number of bracts in an involucre to vary from 4 to 8. Judging by our six years' experience, the species appears to be hardy enough, except that the succulent tips of the shoots are sometimes cut back. This seems to expose it to fungoid attacks, and in this way a number of young plants have been lost at Kew.

DESCRIPTION.—*Shrub* or *tree*, reaching 50–85 (rarely 100) ft. in height; bark grey and smooth; twigs glabrous except when quite young, tawny. *Leaves* usually obovate or obovate-elliptic, shortly or faintly acuminate, 2–4½ in. long, 1¾–3½ in. wide, at first adpressed hairy above but soon glabrous, hoary beneath and softly pubescent; nerves about 5 on each side; petioles 3–8 lin. long. *Bracts* of the involucre usually 6, obovate, shortly apiculate, rarely acuminate, whitish and tinged with yellow or occasionally with pink, 1¾–3¼ in. long, 1–2¾ in. wide. *Flowers* in heads 7–10 lin. in diameter; the fertile accompanied by sterile flowers. *Calyx* adpressed grey-pubescent externally. *Petals* greenish-white. *Drupes* few perfect mixed with many smaller abortive ones, oblong, red, 4–6 lin. long, tipped by the persistent blackish calyx.

Fig. 1, part of underside of a leaf; 2, flower; 3, vertical section of calyx and pistil:—*all enlarged.*

TAB. 8312.

CYMBIDIUM INSIGNE.

Annam.

ORCHIDACEAE. Tribe VANDEAE.

CYMBIDIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 536.

Cymbidium insigne, *Rolfe in Gard. Chron.* 1904, vol. xxxv. p. 387; *Orch. Rev.* 1904, p. 230; 1906, p. 175; *Rev. Hort.* 1907, pp. 495, 496, fig. 166, et ic. col.; *Le Jardin*, 1907, p. 309, fig. 170; *Rev. Hort. Belge*, 1907, p. 53, ic. col.; *Dict. Ic. Orch. Cymb.* t. 10; affine *G. grandiflora*, Griff., sed floribus minoribus dilute roseis et labello suborbiculari distinctum.

Herba; pseudobulbi ovoidei, 6–7 cm. longi. *Folia* elongata, lineari-oblonga, acuta, subcoriacea, 0·5–1 m. longa, 1·3–1·5 cm. lata, basi latiora, conduplicata. *Scapi* suberecti, 0·75–1·25 m. longi, vaginis lanceolatis acutis obtecti; racemi multiflori. *Bracteae* ovatae, acutae, 5 mm. longae. *Pedicelli* 5–6 cm. longi. *Flores* speciosi. *Sepala* et *petala* patentia, subaequalia, elliptico-oblonga, subacuta, dilute rosea, 4–5 cm. longa, apice subrecurva. *Labellum* suborbiculare, trilobum, 3·5–4 cm. longum, dilute roseum, purpureo-maculatum, lobis lateralibus erectis subincurvis apice rotundatis, lobo intermedio suborbiculari obtuso vel emarginato, disco villoso et callis geminis velutinis luteis a basi fere ad apicem instructo. *Columna* clavata, incurva, 2·5 cm. longa.—*Cymbidium Sanderi*, Hort. Sander ex Gard. Chron. 1905, vol. xxxvii. pp. 108, 115, fig. 49; Garden, 1905, vol. lxviii. p. 1, t. 1277.—R. A. ROLFE.

The handsome *Cymbidium* here depicted, which is perhaps the most beautiful member of the genus, was first met with in Annam by Mr. G. Bronckart in February, 1901, growing along ravines and in sandy soil at elevations of from 4,000 to 5,000 ft. above sea-level. Later in the year one of Bronckart's specimens, accompanied by an excellent painting of the plant, was presented to Kew by Mr. G. Schneider; on these the original description of the species was based. According to Bronckart's field note the plant as met with by him is always terrestrial; the spikes in wild plants are from 3 to 4½ ft. in length and bear each from ten to fifteen light-red flowers. Living plants were subsequently sent to this country. In 1904 the species was again met with in Annam by Mr. W. Micholitz when exploring on behalf of Messrs. Sander & Sons, and again dried specimens, with spikes said by

Mr. O'Brien to give evidence of having had seven or eight flowers, and living plants once more reached this country. The plants of this second consignment were distributed under the name *C. Sanderi*, which name, however, cannot now be taken up. In February, 1908, a fine flower spike was presented to Kew by Mr. J. Gurney Fowler, from a plant in his collection at Glebelands, South Woodford, and a living specimen which flowered at Kew in March, 1909, and from which our illustration was prepared, was presented to the collection by Messrs. Sander. The colour of the sepals and petals varies in cultivated plants from white to rose, and there are forms in which the spots on the labellum are even darker than is shown in our plate. The species thrives well under the treatment that best suits *C. grandiflorum* and *C. Tracyanum*; the temperature of a warm greenhouse, a compost consisting of two parts fibrous loam and one part leaf soil with a sprinkling of silver sand and small potsherds. Liberal supplies of water should be afforded whilst growth is being made; thereafter the soil should be kept dry for a few weeks.

DESCRIPTION.—*Herb*; pseudobulbs ovoid, $2\frac{1}{2}$–3 in. long. *Leaves* elongate, linear oblong, acute, $1\frac{1}{2}$–$3\frac{1}{2}$ ft. long, 6–8 lin. wide, rather wider at the base, conduplicate. *Scapes* suberect, $2\frac{1}{2}$–4 ft. long, clothed with lanceolate acute sheaths; racemes many-flowered; bracts ovate, acute, $2\frac{1}{2}$ lin. long; pedicels about 3 lin. long. *Flowers* handsome; sepals and petals spreading, subequal, elliptic-oblong, subacute and somewhat recurved at the tip, pale rose, $1\frac{3}{4}$–2 in. long. *Lip* suborbicular, 3-lobed, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, pale rose with purple blotches; lateral lobes erect, rounded and somewhat recurved at the tip, mid-lobe suborbicular, obtuse or emarginate, the disk villous and bearing two yellow velvety thickened lines extending from the base almost to the tip. *Column* clavate, incurved, 1 in. long.

Fig. 1, crests of the labellum; 2, column; 3, anther-cap; 4, pollinia; 5, sketch of a plant, showing habit;—*all enlarged except 5, which is much reduced.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day

Tab. 8313.

PRIMULA Forrestii.

Western China.

Primulaceae. Tribe Primuleae.
Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Forrestii, *Balf. f. apud Forrest in Not. Roy. Bot. Gard. Edin.* 1908, pars xix. p. 228, cum icon.; affinis *P. bullatae*, Franch., sed bracteis, pedicellis, calyce et corolla haud aureo-farinosis differt.

Herba perennis, 15–90 cm. alta, corolla excepta undique dense glanduloso-pubescens. *Rhizoma* elongatum, crassum, lignosum, apice foliorum annotinorum vestigiis obtectum. *Folia* omnia radicalia, chartacea, irregulariter duplo-crenata vel vix duplo-dentata, juvenilia, subtus sulphurea mox viridescentia; infima reflexa, ovato-elliptica, apice obtusa, basi rotundata vel cuneata, 3·5–5 cm. longa, 1·5–3·3 cm. lata; petioli compressi 3–4 cm. longi; superiora erecta, oblonga elliptico-oblonga vel ovato-oblonga, apice obtusa, basi cordata vel subtruncata, 5–11 cm. longa, 2·5–5·5 cm. lata; petioli supra plani, subtus convexi, 6–9 cm. longi. *Scapi* erecti, robusti, 8–23 cm. longi, folia aequantes vel superantes, umbellum simplicem multifloram gerentes. *Flores* sulfurei; pedicelli 1–4 cm. longi; bracteae foliaceae, late lanceolatae. *Calyx* campanulatus, 10 mm. longus, lobis ovatis apice rotundatis 3 mm. longis. *Corollae* tubus basi cylindricus, superne infundibuliformis, 14 mm. longus, fauce saturate aurantiaco; limbus 2 cm. diametro, lobis luteis late obcordatis. *Capsula* ovoidea, calyce inclusa.—W. G. Craib.

The figure of the handsome *Primula* which forms the subject of our plate has been prepared from material supplied in May, 1909, by Bees, Limited, by whom the species was introduced to cultivation through their collector, Mr. G. Forrest, whose name has been associated with the plant by Professor Bayley Balfour. The species was met with by Mr. Forrest on the eastern flank of the Likiang range in North-western Yunnan at from 9,000 to 11,000 ft. above sea-level. According to him, it is usually found growing in the crevices of dry shady limestone cliffs. It has a long, very tough woody rootstock, with a much tapering base, reaching a total length of 2–3 ft., only 2–3 in. being enclosed in the rock. The free portion is pendulous, except for a few inches at the tip, where it turns outwards and upwards, the upper two-thirds being clothed with the remains of the leaves of former years which, at the apex, form a dense matted mass. This extensive covering, taken in conjunction with the fact that behind the larger specimens the rock has been scored and worn into

grooves over an inch deep by the motion of the whole plant in the breeze, seems to indicate that some individuals must reach a considerable age. *P. Forrestii* in habit greatly resembles *P. bracteata*, Franch., and *P. bullata*, Franch., both of which also affect limestone rocks, and to both of which it is morphologically very nearly allied. From the former our species is readily distinguished by the corolla tube exceeding the calyx, by the longer scapes, and by the cordate bases of its larger upper leaves; from the latter it is easily separated owing to the fact that the bracts, pedicels and calyx are not farinose. The leaves when young are sulphur-yellow on the underside, but become green beneath as they mature. The plants growing at Kew have proved healthy in a cold frame; whether they may prove hardy in the open it is not yet possible to say. They have thriven well in a loamy soil, forming a many-crowned tuft.

Description.—*Herb*, perennial, 6 in. to 3 ft. high, densely covered with glandular hairs except on the corolla. *Rootstock* long, stout and woody, clad, especially at the apex, with the remains of old leaves. *Leaves* all radical, chartaceous, irregularly twice crenate or almost toothed, when young yellow, soon becoming green, beneath; the lowest reflexed, ovate-elliptic, obtuse with base cuneate or rounded, $1\frac{1}{2}$–2 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide, the petioles compressed, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long; the upper erect, oblong, elliptic-oblong, or ovate-oblong, obtuse with base subtruncate or cordate, 2–$4\frac{1}{4}$ in. long, 1–$2\frac{1}{4}$ in. wide, the petioles flattened above, convex beneath, $2\frac{1}{2}$–$3\frac{1}{2}$ in. long. *Scapes* erect, stout, 3–9 in. long, as long as or longer than the leaves; umbels simple, many-flowered. *Flowers* sulphur-yellow with a deep orange eye; pedicels $\frac{1}{3}$–$1\frac{1}{2}$ in. long; bracts wide lanceolate, leafy. *Calyx* campanulate, 5 lin. long; lobes ovate with rounded tips, under 2 lin. long. *Corolla* with a tube 7 lin. long, cylindric at the base, funnel-shaped upwards, throat deep orange; limb $\frac{3}{4}$ in. across, lobes widely obcordate, sulphur-yellow. *Capsule* ovoid, enclosed in the calyx.

Fig. 1, calyx and pistil; 2, the same, calyx in section; 3, section of corolla; 4 and 5, anthers:—*all enlarged.*

S. del J.N. Fitch. lith.

Vincent Brooks, Day & Son Ltd. imp

Tab. 8314.

NOTHOFAGUS antarctica, var. uliginosa.

Temperate South America.

Cupuliferae. Tribe Quercineae.

Nothofagus, *Blume, Mus. Bot. Lugd.-Bat.* vol. i. p. 307.—Fagus, *Linn.*, sect. Nothofagus, *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 410.

Nothofagus antarctica, *Oersted in Vidensk. Selsk. Sk.* ser. 5, vol. ix. p. 354; *De Wildeman, Voy. Belgica*, p. 73; *Dusén in Svensk. Exped. Magell.* vol. iii. n. 5, p. 198; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. iii. p. 553, t. 202, f. 1; var. **uliginosa**, *Reiche, Beitr. Chil. Buchen*, p. 11; *Macloskie in Rep. Princeton Univ. Exped. Patag.* vol. viii. p. 328; *Elwes & Henry*, l.c. p. 554; a typo foliis utrinque pilis minutis erectis vestitis differt.

Arbor interdum magnum vel in montibus arbuscula vel frutex; rami sparse albido-lenticellosi, juniores pilis erectis dense vestiti; gemmae ovoideae, leviter compressae, 3 mm. longae, glabrae, squamis paucis obtectae. *Folia* oblongo-ovata, elliptico-ovata vel ovata, 1–2·5 cm. rarius usque ad 4 cm. longa, 6 mm. – 1·5 cm. rarius usque ad 2·5 cm. lata, apice rotundata, basi inaequalia, truncata vel leviter cordata, irregulariter crebreque crenulato-denticulata, interdum obscure lobata, supra atro-viridia, infra pallidiora, utrinque pilis minutis erectis vestita, primo plicata; nervi saepius utrinque 4; petiolus 1–4 mm. longus, pubescens. *Flores masculi* axillares, solitarii vel interdum geminati, breviter pedunculati. *Perianthium* campanulatum, 4 mm. longum, saepe 5-lobatum, lobis late ovatis circiter 2 mm. longis uno saepius ceteris minori parce ciliatis. *Stamina* 10–29, exserta; antherae lineari-oblongae, 2·5–3·5 mm. longae, conspicue apiculatae. *Flores feminei* axillares, sessiles. *Fructus* involucrum 4-valvatum; valvae oblongae, 5–6 mm. longae, parce ciliatae, quaque squamis 3–5 transversis brevissimis scariosis rubidis praedita. *Nuculae* 3, circiter 4 mm. longae, media 2-alata, laterales 3-alatae.—*Fagus antarctica*, Forster, var. *uliginosa*, A.DC. in DC. Prodr. vol. xvi. pars 2, p. 120; Bean in Kew Bull. 1906, p. 381. *F. uliginosa*, Phil. ex A.DC. l.c.—S. A. Skan.

The Southern Beeches, at one time considered congeners of the Northern ones, are now usually treated as belonging to a distinct genus, *Nothofagus*, which includes 17 species, whereof 8 are South American, 6 belong to the New Zealand flora, and 3 are Australian or Tasmanian. These southern species differ from the members of the northern genus *Fagus* in that the male flowers are solitary, geminate, or in threes, while the fruit, which is relatively small and contains 1–3 nutlets, usually has the 2–4 involucral valves with transverse entire toothed or lobed scales. They are evergreen or deciduous trees or shrubs with usually very small leaves.

May, 1910.

Nothofagus antarctica is widely spread in temperate South America from lat. 38° S. to Tierra del Fuego, where, as in Patagonia, it and the evergreen *N. betuloides* are the dominant trees. But while *N. antarctica*, in one or other of its forms, has several times been introduced to the gardens of Great Britain—its earliest introduction was effected by Sir Joseph Hooker, 70 years ago, when he was attached to the famous expedition under Sir James Ross in the "Erebus" and "Terror"—it never appears to have become permanently established in this country. A goodly number of fine examples of its natural companion, *N. betuloides*, may be met with in the milder parts of the British Isles, but of *N. antarctica* itself there are few. Indeed, if we except the young trees raised from seed brought from Chili by Mr. H. J. Elwes in 1902, there is but one well-known specimen; this grows at Hafodunos in Denbighshire, and is believed to be over 30 years old. From this it would seem as if the species is not altogether adapted to our climate. Yet the young trees in the collection at Kew are growing with remarkable vigour, and passed through the trying winter of 1908–9 without injury.

According to Mr. Elwes, *N. antarctica* is the commonest species met with by him, during his South American journey, at high elevations on both sides of the Chili-Argentine frontier. He found it associated with *Araucaria* at 4,000 ft. above sea-level, and it occurs frequently in marshy situations on the plain of Valdivia. The variety here figured is known in Chili as "Mere." It forms a dense scrub on the Argentine side of the frontier; near the Baths of Chillian it goes up to 7,000 ft. or even higher, and covers the summits of the mountains round Lake Nahuel-huapi up to 6,000 ft. When seen here by Mr. Elwes in the month of February the leaves had turned a brilliant red. This variety was again met with by the Princeton University Expedition growing in Patagonian swamps and in woods at Chubut in the Argentine Andes. The individual which supplied the material on which our figure is based was raised from seed collected by Mr. Elwes near Lake Meliquina. It is now a small tree, 16 ft. high; it flowered very freely in a clump of heaths near the Pagoda at Kew in May, 1909. The plants at Kew are grown in various soils; those in the average sandy loam

with which a little peat has been mixed thrive best. Our young trees are of rather thin, open habit, making, at present, annual shoots 1–3 ft. in length. Their distichous mode of branching adds to the peculiar elegance and distinctiveness of their appearance. Propagation is readily effected by means of layers, but it is doubtful whether trees so raised will make such well-grown specimens as those obtained from seed.

DESCRIPTION.—*Tree*, often of considerable size; at high elevations a small tree or shrub; branches sparingly white-lenticelled; twigs densely covered with erect hairs; buds ovoid, somewhat compressed, under 2 lin. long, glabrous, with few scales. *Leaves* oblong-ovate, elliptic-ovate, or ovate, $\frac{1}{3}$–1 in., rarely $1\frac{1}{2}$ in. long, 3–8 lin., rarely 1 in. wide, tip rounded, base unequal, truncate or slightly cordate, irregularly closely crenate denticulate, occasionally obscurely lobed, dark green above, paler beneath, with minute erect hairs on both sides, plicate when young; nerves usually 4 on each side, petiole 2 lin. long or less, pubescent. *Male flowers* axillary, solitary or occasionally geminate, shortly peduncled. *Perianth* campanulate, 2 lin. long, often 5-lobed; lobes wide ovate, sparingly ciliate, about 1 lin. long, one usually smaller than the others. *Stamens* 10–29, exserted; anthers linear-oblong, 1–$1\frac{1}{2}$ lin. long, distinctly apiculate. *Female flowers* axillary, sessile. *Fruit* with a 4-valved involucre; valves oblong, about 3 lin. long, sparingly ciliate, each with 3–5 very short transverse scarious reddish scales. *Nutlets* 3, about 2 lin. long, the central 2-winged, the two lateral 3-winged.

Fig. 1, portion of a leaf; 2, male flowers; 3, stamen; 4, bract; 5, perianth of a female flower; 6, the same, laid open; 7, ovaries, the involucre removed; 8, fruit, showing involucre and nutlets; 9, nutlet:—*all enlarged.*

Vincent Brooks, Day & Son, Lith.

Tab. 8315.

CORNUS FLORIDA, var. RUBRA.

Eastern North America.

CORNACEAE.

CORNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 950.

Cornus florida, *Linn. Sp. Pl.* 117; **var. rubra**, *Hort. Parsons*; *Rev. Hort.* 1894, p. 600; species *C. Nuttallii*, Audub., et *C. Kousae*, Buerg., proxime accedens, ab hac tamen bracteis amplioribus haud acuminatis foliisque majoribus facile distinguenda, ab illa involucris amotinis statim sejunguenda.

Arbor dumosa sylvestris interum 10-metralis, culta potius arbuscula 4–5-metralis, ramis patentibus; ramuli teretes, rubescentes, mox glabrescentes. *Folia* lata elliptica ovatave, apice breviter acuminata, utrinque sed praesertim subtus pubescentia, 7·5–12·5 cm. longa, 4–7·5 cm. lata, supra saturate viridia, subtus pallidiora glaucescentia. *Bracteae* involucrantes saepissime 4 per autumnum genitae, per hiemem capitulum terminale foventes, primo vere inflorescentes denique aestate ineunte plane evolutae inflorescentiam speciosam 7·5–11·5 cm. latam praebentes; singulae petaloideae, obcordatae, 3–5 cm. longae, roseae nervis parallelis saturatioribus notatae, apice emarginato plus minusve deflexae. *Flores* 6 mm. longi in capitulum densum 1·3 cm. latum aggregati. *Calycis* lobi 4, obtusi, pubescentes. *Corollae* lobi 4, liguliformes, apice lutescente excepto virides, pubescentes. *Stylus* columnaris; stigma truncatum. *Fructus* ovoideus, 1·3 cm. longus, maturitate rubescens; caro tenuis, farinulenta; semina pro quaque pyrene 1 vel 2.—W. J. Bean.

Cornus florida, according to Sargent, is one of the commonest and most generally distributed of deciduous trees and shrubs in the Middle and Southern United States, and occurs at all elevations from sea-level to nearly the summits of the higher Alleghany Mountains. The type, figured in 1801, at t. 526 of this work, has been in England nearly 200 years. It was in the nursery of Thos. Fairchild at Hoxton in 1730; nine years later it was in the Chelsea Botanic Garden. The variety figured, which is rare in a wild state, was first introduced by Messrs. Parsons, of Flushing, New York. The material for our figure was supplied by Mr. B. E. C. Chambers, from his garden at Grayswood Hill, Haslemere, which contains a remarkable assemblage of rare trees and shrubs, admirably cultivated.

May, 1910.

The only other cultivated Cornels with which *C. florida* is likely to be confused are *C. Nuttallii*, Audub., figured at plate 8311 of this work, and the Japanese *C. Kousa*, Buerg. The former is distinguished by the flower-heads not being enclosed by the involucre during winter, and by the usually more numerous bracts with acute, but not deflexed, apices. *C. Kousa* differs from both in its smaller ovate-lanceolate, acuminate bracts, and in its smaller leaves.

The bark of *C. florida*, officinally known as "Dogwood Bark," yields cornine, a bitter principle which has astringent, tonic and stimulative properties. It was at one time valued, especially in America, in intermittent fevers.

Cornus florida is unlikely to occupy an important place in English gardens, except, perhaps, in the more favoured ones of the south and west. In Ireland, South Wales and in the west of Scotland it ought to succeed in many places; and in those favoured regions few more beautiful shrubs can be grown. At Kew it succeeds only under protection. Mr. Chambers informs us that his plant of var. *rubra* is now 10 ft. high and 8½ ft. through, and that it is much more floriferous and lasts a longer time than the ordinary white-"flowered" type. It is grown in open sandy loam fully exposed to the sun.

Description.—*Tree*, of bushy habit, occasionally 40 ft. high in a wild state, usually a wide-spreading bush less than 15 ft. high under cultivation. *Young branches* terete, glabrescent, tinged with red. *Leaves* broadly elliptic or ovate, pubescent on both surfaces, especially beneath, 3–5 in. long, 1½–3 in. wide, dark green above, pale and glaucescent beneath, with a short acuminate apex. *Involucre* terminal, forming in autumn and enclosing the flower-head during winter, expanding in spring, reaching its fullest beauty in May, when it has become 3–4½ in. across. *Bracts* 4, petal-like, obcordate, 1¼–2 in. long, 1 in. wide, parallel-veined, bright rosy red, apex notched and decurved. *Flowers* 3 lin. long, produced in a crowded head ½ in. across. *Calyx-lobes* 4, pubescent, obtuse. *Corolla-lobes* 4, ligulate, pubescent, green, tipped with yellow. *Style* columnar, with a truncate stigma. *Fruit* an ovoid drupe ½ in. long, red when ripe; flesh thin, mealy; stone containing one or two seeds.

Fig. 1, flowers; 2, section of calyx and pistil; 3 and 4, anthers:—*all enlarged.*

F.S. del. J.N. Fitch lith

Vincent Brooks Day & Son Lith. imp.

Tab. 8316.

ACANTHOPANAX Henryi.

West China.

Araliaceae. Tribe Schefflereae.

Acanthopanax, *Miq.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 398; *Harms in Engl. & Prantl, Nat. Pflanzenf.* vol. iii. pars 8, p. 49.

Acanthopanax Henryi, *Harms in Engl. & Prantl, Nat. Pflanzenf.* vol. iii. pars 8, p. 50; *Hemsl. in Journ. Linn. Soc.* vol. xxxvi. p. 451; *C. K. Schneider, Ill. Handb. Laubholzk.* vol. ii. p. 424; affinis *A. leucorrhizo*, Harms, sed foliolis supra scaberulis infra (saltem ad nervos) subvillosulis acutis vel breviter acuminatis minute dentatis, pedunculis pedicellisque robustioribus brevioribus distincta.

Frutex 2 m. vel ultra altus; rami citissime glabrati, aculeis e basi longitudinaliter elongata subito conicis compressis saepe recurvis armati. *Folia* 5-, raro 3-foliolata; petiolus 3–5·5 cm. longus, primo magis minusve villosulus, deinde praeter apicem glabratus; foliola oblanceolata vel late lanceolato-ovata, acuta vel breviter acuminata, basi saepe cuneatim in petiololum 3–6 mm. longum attenuata, integra vel saepius a medio arcte minuteque (rarius magis conspicue) dentata, intermedium 6–12 cm. longum, 2·5–3 (rarius 4) cm. latum, supra saturate viridia, scaberula, infra pallidiora, magis minusve (imprimis ad nervos) villosula, nervis utrinque circiter 7. *Umbellae* ad apices ramorum subumbellatim congestae; terminalis caetera longe praecedens, multiflora, densa, 1·5–3 cm. diametro, pedunculo robusto subglabro vel villosulo vel subtomentoso, 2·5–3·5 cm. longo suffulta; pedicelli sub anthesi 9–12 mm. longi, eodem indumentum ac pedunculi induti, inarticulati. *Ovarium* glabrum vel magis minusve villosulum, obovoideum, sub anthesi 1–2·5 mm. longum; discus 1·5–2·5 mm. diametro. *Petala* ovarium aequantia vel subaequantia. *Styli* florum fertilium 1·5–2·2 mm. longi, connati; stigmata punctiformia. *Baccae* demum nigrae, globosae, 9–10 mm. diametro.—*Eleutherococcus Henryi*, Oliv. in Hook. Ic. Pl. xviii. t. 1711; Hemsl. in Journ. Linn. Soc. vol. xxiii. p. 341.—O. Stapf.

The *Acanthopanax* here figured was first discovered in Hupeh, Central China, by Mr. A. Henry, and was introduced to cultivation by Messrs. J. Veitch & Sons through their collector, Mr. E. H. Wilson. From one of the plants raised by Messrs. Veitch in their nursery at Coombe Wood and obtained from them for the Kew collection in 1905,

the material for our illustration has been taken. This plant is now 5 ft. high and as much through, with stout, straight thorny branches and of sturdy rather than graceful habit. As a shrub for gardens it is, on the whole, more curious than beautiful; at the same time, the foliage is handsome and the globose heads of inky black fruits are striking. The leaflets are variable as regards shape and degree of pubescence. The flowers are not particularly attractive; they do not appear, as a rule, until August and September. The fruits ripen in October and continue until Christmas. The plant succeeds well in ordinary loamy soil and may safely be deemed hardy. The bark of the root is employed in China as a drug.

Description.—*Shrub*, 5 ft. or more in height, branches soon becoming glabrous, armed with flattened, abruptly conical often recurved thorns with longitudinally expanded bases. *Leaves* 5-, rarely 3-foliolate; petiole $1\frac{1}{2}$–2 in. long, at first more or less puberulous, soon becoming glabrous except near the tip; leaflets oblanceolate or wide lanceolate-ovate, acute or shortly acuminate, often narrowed at the base into a petiolule 2–3 lin. long, entire or often from the middle onwards closely finely serrate, occasionally more conspicuously toothed, the central $1\frac{1}{2}$–5 in. long, 1–$1\frac{1}{4}$, rarely $1\frac{3}{4}$ in. wide, deep green and scaberulous above, paler and more or less pubescent especially in the nerves beneath; lateral nerves about 7 on each side. *Umbels* clustered at the ends of the branches, the terminal much larger than the others, many-flowered, dense, $\frac{1}{2}$–$2\frac{1}{4}$ in. across; peduncles stout, almost glabrous or pubescent or somewhat tomentose, 1–$1\frac{1}{2}$ in. long; pedicels in flower 4–6 lin. long, with the same degree of pubescence as their peduncles, never articulate. *Ovary* glabrous or more or less pubescent, obovoid, in flower $\frac{1}{2}$–$1\frac{1}{4}$ lin. long; disk $\frac{3}{4}$–$1\frac{1}{4}$ lin. across. *Petals* almost or quite as long as the ovary. *Styles* of the fertile flowers $\frac{3}{4}$–1 lin. long or slightly longer, connate; stigmas minute. *Berry* black, globose, 4–5 lin. in diameter.

Fig. 1, male flower; 2, calyx and pistil of a hermaphrodite or female flower with short styles; 3, section of a female flower; 4, calyx and pistil of a hermaphrodite or female flower with long styles; 5, a pyrene; 6, section of the same; 7, embryo:—*all enlarged.*

TAB. 8327.

BULBOPHYLLUM VIRESCENS.

Java.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum virescens, *J. J. Sm. in Bull. Inst. Buitenz.* vol. vii. (1900), p. 3; *Ic. Bogor.* vol. ii. p. 99, t. 119, fig. A; *Rolfe in Orch. Rev.* 1904, p. 272; *Gard. Chron.* 1906, vol. xl. p. 261, suppl. tab.; *Orchis*, 1909, p. 123, figs. 16, 17; a *B. Binnendijkii*, Sm., sepalis petalisque viridibus immaculatis differt.

Herba epiphytica. *Rhizoma* repens, validum, vaginis striatis imbricatis obtectum. *Pseudobulbi* distantes, lineari-oblongi, striati, 10–13 cm. longi, monophylli, basi vaginis ovatis striatis obtecti. *Folia* petiolata, coriacea, ovato-oblonga, subacuta, 15–20 cm. longa, 7–8 cm. lata; petioli 2–5 cm. longi. *Scapi* suberecti, 16–20 cm. longi, apice decurvi, vaginis spathaceis obtecti. *Bracteae* anguste lanceolatae, acuminatissimae, 2–2·5 cm. longae. *Pedicelli* 2–2·5 cm. longi. *Flores* umbellati, magni, speciosi, 8–10. *Sepala* patentia, ovato-lanceolata, caudato-acuminata, 10–12 cm. longa, pallide viridia, brunneo-venosa et reticulata. *Petala* anguste ovato-lanceolata, caudato-acuminata, 3·5–4 cm. longa, pallide viridia, brunneo-venosa. *Labellum* recurvum, cordato-ovatum, subobtusum, subcarnosum, circiter 2 cm. longum, pallide viride, basi purpureum. *Columna* brevissima, basi in pedem latum producta; dentes oblongi, obtusi.—R. A. ROLFE.

The striking *Bulbophyllum* which forms the subject of our illustration is a member of a very distinct group of Malayan species which includes *B. Pahudii*, Reichb. f., *B. Ericssoni*, Kraenzl., figured at t. 8,088 and *B. Binnendijkii*, J. J. Sm., figured at t. 8,187 of this work. From the last-mentioned species, which is its nearest ally, our plant differs in a few minor structural details and in having flowers without spots. *B. virescens* was first described ten years ago from specimens collected on Mount Tuna in the island of Amboina, at about 2,500 feet above sea level. Shortly thereafter plants which, on flowering, proved to belong to this species were obtained by Messrs. Hugh Low & Co. from an island off the coast of New Guinea. The plant from which our figure has been made was acquired by purchase from Messrs. Low in 1905; it flowered in the tropical Orchid house at Kew in June,

1909, and was as remarkable in appearance as it was disagreeable in odour. It requires the same cultural treatment as its near allies, *B. Ericssoni* and *B. Binnendijkii*; a shallow teak basket, a compost of sphagnum, peat fibre and dead leaves, with a position close to the roof glass in a moist tropical house. When the plant is making new growth plenty of water should be supplied; when growth has finished only enough water should be given to prevent the soil from becoming quite dry.

Description.—*Herb*, epiphytic; rhizome creeping, stout, clothed with striate imbricating sheaths; pseudobulbs remote, linear-oblong, striate, 4–5 in. long, 1-leaved, clothed at the base with ovate striate sheaths. *Leaves* petioled, coriaceous, ovate-oblong, subacute, 6–8 in. long, $2\frac{1}{2}$–$3\frac{1}{2}$ in. wide; petioles $\frac{3}{4}$–2 in. long. *Scapes* suberect, 6–8 in. long, their apices decurved, clothed with spathaceous sheaths; bracts narrow lanceolate, very long acuminate, $\frac{3}{4}$–1 in. long; pedicels as long as the bracts. *Flowers* large and showy, in 8–10-flowered umbels. *Sepals* spreading, ovate-lanceolate, caudate-acuminate, 4–5 in. long, pale green, with brownish veins and nerves. *Petals* narrowly ovate-lanceolate, caudate-acuminate, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, pale green with brownish nerves. *Lip* recurved, cordate-ovate, subobtuse, somewhat fleshy, about $\frac{3}{4}$ in. long, pale green with a purple base. *Column* very short, produced below into a wide foot; teeth oblong, obtuse.

Fig. 1, column and foot; 2, pollinia:—*both enlarged.*

4
5
3
2
1

TAB. 8328.

PATRINIA TRILOBA.

Japan.

VALERIANACEAE.

PATRINIA, *Juss.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 153.

Patrinia (Centrotrinia) **triloba**, *Miq. in Verh. Kon. Akad. Wetensch.* vol. ii. pars iv. p. 22; *Maxim. Mél. Biol.* vol. viii. p. 420; affinis *P. gibbosae*, Maxim., sed corolla paulo majore, caule basi haud nudo, foliis ambitu cordatis vel cordato-ovatis profunde lobatis distincta.

Herba perennis, erecta, inflorescentia excepta simplex 20-40 cm. alta. *Caulis* teres, rubescens, cum pedunculis bifacialiter pubescens, nodis pubescentibus. *Folia* petiolata, petiolis ad 9 cm. longis caulem amplectentibus, radicalia ambitu cordata, superiora cordato-ovata ad 7 cm. longa, 5 cm. lata, profunde palmatim tri- vel quinque-lobata, lobis basalibus minoribus, terminali majore rhombeo plus minusve trilobo, nervis e basi plerumque 5, nervulisque subtus conspicuis, acumine excepto grosse serrata, supra parce subtus in nervis marginibusque puberula. *Cymae* ternae; bracteae infimae foliaceae ambitu ovato-lanceolatae, trilobae, circiter 1·5 cm. longae, 8 mm. latae, grosse serratae, summae lineares, ciliatae, serratae integraeve ad 1 cm. longae, 1 mm. latae. *Calycis* lobi minuti. *Corolla* lutea, tubulosa, 7 mm. longa, calcarata, calcari 2 mm. longo et circiter 1 mm. diametro, tubo calcari aequilongo, extra glabro intus pilis longiusculis obsito. *Stamina* exserta; filamenta fere 5 mm. longa, pilis divergentibus parce instructa. *Ovarium* circiter 2 mm. altum, glabrum; stylus 5 mm. longus, glaber, stigmate capitato. *Fructus* paleae nervosae fere triplo majori adnatus.—*P. palmata*, Maxim. Mél. Biol. vol. vi. p. 267; Bull. Acad. Imp. Petersb. vol. xii. p. 67; Franch. et Savat. Enum. Pl. Jap. vol. i. p. 216. *P. palmatifida*, Maxim. ex Miq. in Verh. Kon. Akad. Wetensch. vol. ii. pars iv. p. 22. *Valeriana triloba*, Miq. in Prol. Fl. Jap. p. 272.—W. G. CRAIB.

The plant here figured, which was raised at Kew from seed received from the Tokyo Botanic Garden, quite merits the encomium "decus generis," bestowed upon it by the late Mr. Maximowicz when he for the first time published it under its proper genus. Its nearest ally is *Patrinia gibbosa*, Maxim., like the subject of our illustration a native of Japan; both are members of the section *Centrotrinia*, founded by Maximowicz to include those species in which the corolla is gibbous or spurred and the fruit is adnate to an accrescent bract. *P. triloba* is, however, readily distinguished from *P. gibbosa* by its larger flowers, its rather smaller, sharply lobed and cordate leaves and its leafy stem. Siebold was the first European botanist to meet with *P. triloba*, which is

confined to the woodland tracts of Central and Northern Japan; his specimens formed the basis of *Valeriana triloba*, Miq. It was again met with by Maximowicz, whose specimens were distributed as *Patrinia palmatifida*, a name modified in 1867, when the species was formally published, to *P. palmata*. The study of the specimens issued by Maximowicz had meantime satisfied Miquel that the plants collected by Siebold and by Maximowicz are conspecific and that the generic position accorded to the species by Maximowicz is correct. The adjustment of name thereby rendered necessary was made by Miquel in 1870 and endorsed by Maximowicz a year later. *P. triloba* is a hardy herbaceous perennial, easily cultivated under the conditions suitable for most of the species of *Patrinia* and *Valeriana*. It thrives well in the Rock Garden at Kew, where it is in flower in July and August, the months during which it also flowers in a wild state.

Description.—*Herb*, perennial; stems erect, terete, reddish, 8–16 in. high, unbranched below the inflorescence, with lines of pubescence on the peduncles and with pubescent nodes. *Leaves* petioled, the radical cordate, those of the stem ovate-cordate, deeply palmately 3- or 5-lobed, and usually 5-nerved from the base, the largest 3 in. long, 2 in. wide; basal lobes rather smaller than the rhomboid more or less 3-lobed central; main and secondary nerves beneath rather prominent; margin rather coarsely toothed except towards the tips of the lobes; sparingly hairy above, more markedly pubescent on the margins and along the nerves beneath; petioles slender $3\frac{1}{2}$ in. long, stem-clasping at the base. *Cymes* 3-nate; lower bracts leafy, ovate-lanceolate, 3-lobed, coarsely toothed, about 8 lin. long, 4 lin. wide, upper linear, ciliate, toothed or entire, 5 lin. long. *Calyx-teeth* minute. *Corolla* yellow, tubular, $3\frac{1}{2}$ lin. long, with a spur about 1 lin. long; tube as long as the spur, glabrous without, hirsute with rather long hairs within. *Stamens* exserted; filaments nearly $2\frac{1}{2}$ lin. long, sparingly hirsute with spreading hairs. *Ovary* glabrous, about 1 lin. long; style glabrous, $2\frac{1}{2}$ lin. long; stigma capitate. *Fruit* adnate to a large, veined pale.

Fig. 1, flower; 2, calyx and pistil; 3, section of corolla-tube; 4 and 5, anthers: —*all enlarged.*

S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Limp

TAB. 8329.

PTEROSTYRAX HISPIDUM.

Japan.

STYRACEAE.

PTEROSTYRAX, *Sieb. et Zucc. Fl. Jap.* vol. i. p. 94.

Pterostyrax hispidum, *Sieb. et Zucc. in Abh. Akad. Muench.* vol. iv. pars iii. p. 132; *Carrière in Rev. Hort.* 1875, p. 307, fig. 50, et 1876, p. 394, fig. 83, 84; *Franch. et Savat. Enum. Pl. Jap.* vol. i. p. 310; *Peters in Engler, Pflanzenr.—Styracaceae*, p. 103 (hispidus); affinis *P. corymboso*, Sieb. et Zucc., sed floribus in paniculo angusto elongato dispositis et fructu distinguenda.

Arbor ramis glabris et cortice cinereo-brunneo. *Folia* alterna, exstipulata, petiolis 1–2·5 cm. longis, laminis 6–21 cm. longis, 3–10 cm. latis ellipticis acutis vel breviter acuminatis basi acutis denticulatis supra viridibus subtus pallidioribus et glabris vel minutissime albido-tomentosis secus venis pubescentibus. *Paniculi* axillares, 10–16 cm. longi, 4–5 cm. lati, adscendentes vel penduli, basi 2–3-foliati, superne ebracteati, pilis patulis pubescentes, ramis patentibus 1·5–2 cm. longis bifurcatis secundifloris, floribus subconfertis. *Pedicelli* 1–2 mm. longi. *Calyx* obconicus, pluricostatus, 5-dentatus, minute albo-tomentosus, dentibus 1–1·3 mm. longis deltoideo-ovatis acutis. *Corolla* fere ad basin 5-partita, utrinque minute subtomentosa, alba, lobis 8 mm. longis 3–3·5 mm. latis patentibus vel recurvis elliptico-oblongis obtusissimis. *Stamina* 10, 1–1·1 cm. longa, filamentis pubescentibus basi in tubo connatis; antherae lineari-oblongae, dorsifixae. *Ovarium* inferum, 3-loculare, loculis 4-ovulatis; stylus staminibus longior, basi conico-incrassatus, pubescens. *Ovula* medio axi affixa, 2 superioribus erectis 2 inferioribus pendulis. *Fructus* 1 cm. longus, 2·5 mm. crassus, subclavato-fusiformis, pluri-costatus, haud alatus, dense hispidus, stylo terminatus.—*Halesia hispida*, Mast. in Gard. Chron. 1884, vol. xxii. p. 176, fig. 34, et 1909, vol. xlvi. p. 89; Shirasawa, Ic. Jap. vol. ii. t. 65, fig. 1–3.—N. E. BROWN.

The genus *Pterostyrax*, to which the subject of our plate belongs, is so nearly allied to *Halesia*, Linn., and so similar to that genus in floral characters, that in the Genera Plantarum the two were united by Bentham and Hooker. But the position of the inflorescence, the absence of broad wings on the fruit, the shape of the corolla and the difference in number of corolla lobes so markedly distinguish *Pterostyrax* and *Halesia* that the two are now, by almost universal consent, kept apart. The two groups inhabit different areas, for while *Halesia* is an American genus, *Pterostyrax* is

confined to the old world, being represented by three species in Japan and by two in China. Specimens of one of the Chinese species have indeed at times been referred to the species here depicted; this identification, it is now found, cannot be sustained. One of the most distinct and beautiful of hardy trees, *P. hispidum* grows well at Kew, and flowers freely almost every year. When its branches are furnished with their long pendent panicles, an example of *P. hispidum* is one of the most effective ornaments of the garden, the more so because, flowering as it does in late June, it escapes comparison with other trees, equally striking, which by then are out of flower. It thrives in a good loamy soil and in a sunny situation and, like most trees of its class, flowers most abundantly after a hot autumn. It has never suffered in the least from frost at Kew, but it grows to a larger size and more quickly in the warmer counties, and the material from which our plate has been prepared was derived from a particularly handsome specimen in the garden of Canon Ellacombe at Bitton, near Bristol. In the south-west of Ireland there are some splendid examples approaching 40 feet in height and more in diameter of crown. The species should be raised from seed which occasionally ripens in this country and has been offered several times in recent years for exchange in the Kew seed-list. Japanese nurserymen also offer it at moderate rates, but usually under the name of its nearest ally, *P. corymbosum*. The variable character of the underside of the leaves is not due to age, for leaves that are finely white tomentose and leaves that are glabrous beneath may be found on the same branch.

Description.—*Tree*, with glabrous branches and ashy-brown bark. *Leaves* alternate, denticulate $2\frac{1}{2}$–8 in. long, $1\frac{1}{4}$–4 in. wide, elliptic, acute or shortly acuminate, base cuneate, green above, paler and smooth or in leaves of the same age finely white tomentose beneath, the veins pubescent; petiole $\frac{1}{2}$–1 in. long; stipules 0. *Panicles* axillary, 4–6 in. long, $1\frac{3}{4}$–2 in. wide, ascending or pendent, 2–3-leaved at the base, bractless above, pubescent with spreading hairs, their branches spreading, $\frac{3}{4}$–1 in. long, 2-furcate; flowers somewhat clustered and secund, their pedicels 1 lin. long or less. *Calyx* obconic, many-nerved,

5-toothed, finely white pubescent; teeth about $\frac{1}{2}$ lin. long deltoid-ovate, acute. *Corolla* 5-partite almost to the base, white, finely pubescent on both sides; lobes 4 lin. long, $1\frac{1}{2}$–2 lin. wide, elliptic-oblong, quite obtuse, spreading or recurved. *Stamens* 10, 5–6 lin. long; filaments pubescent and connate below; anthers linear-oblong, dorsifixed. *Ovary* inferior, 3-celled, the cells 4-ovuled; style longer than the stamens, pubescent, thickened downwards; ovules attached near the centre of the axis, the upper pair erect, the lower pair pendulous. *Fruit* 5 lin. long, 1 lin. wide, subclavately fusiform, many-ribbed, wingless, densely hispid, tipped by the style.

Fig. 1, flower, partly open; 2, calyx and pistil in longitudinal section; 3, part of the staminal tube and stamens; 4, ovary in transverse section; 5, young fruit:—*all enlarged.*

M.S. del. J.N. Fitch lith

Vincent Brooks Day & Son Lith.

TAB. 8330.

GAMOGYNE PULCHRA.

Malaya.

AROIDEAE. Tribe PHILODENDREAE.

GAMOGYNE, *N. E. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 985.

Gamogyne pulchra, *N. E. Br. in Kew Bull.* 1910, p. 197; affinis *G. Burbidgei*, N. E. Br., sed pistillodiis basalibus, staminodiis deficientibus, stigmatibus rubris spathaque kermesina differt.

Herba perennis, acaulis, omnino glabra. *Folia* suberecta, petiolata; lamina 3–17 cm. longa, 2–3·7 cm. lata, lanceolata, acuta, basi cuneato-acuta, supra viridis subtus pallidior; petiolus 5–9 cm. longus, teres, canaliculatis, basi breviter sed late vaginans. *Pedunculi* erecti circiter 14 cm. longi, teretes, rufo-brunnei. *Spatha* subnutans, ellipsoidea, acuta, convoluta, apice tantum aperta, 4–4·5 cm. longa, 2 cm. diametro, laete kermesina. *Spadix* quam spatha fere duplo brevior, inclusus, cylindraceus, obtusus, parte feminea quam pars mascula subduplo breviore basi organis neutris (ovariis abortis) truncatis flavo-virentibus instructa, parte mascula parti femineae contigua staminodiis deficientibus. *Antherae* oblongae, compressae, truncatae, apice biporosae, flavescentes. *Ovaria* oblonga, truncata, connata stigmatibus puniceis sessilibus, 1-locularia placentis duabus parietalibus et basalibus brevibus. *Ovula* plurima, erecta, suborthotropa, funiculis elongatis.—N. E. BROWN.

The plant now figured was received at Kew from the Singapore Botanic Gardens in 1905 with the suggestion that it might be a form of *Piptospatha Ridleyi*, N. E. Br., figured at t. 7410 of this work; another species of the same genus, *P. insignis*, N. E. Br., is given at t. 6598. The two genera are indeed so closely allied as to be indistinguishable so far as any vegetative character is concerned. They are, however, readily discriminated when in flower because in *Piptospatha* the connective is produced and the ovaries are distinct, whereas in *Gamogyne*, the genus to which our plant belongs, the anthers are truncate and the ovaries are united. The plant figured has been grown on a small rockery in the Nepenthes house, where it has thriven well and has formed a sturdy tuft of leaves; it flowered for the first time in March, 1909, and thus enabled its generic position to be ascertained. As a garden plant *Gamogyne pulchra* is superior to either of the species of *Piptospatha* mentioned above, and in this respect is even preferable to its nearest ally, *Gamogyne Burbidgei*, N. E. Br., a Bornean

plant which is well known in tropical collections. The botanical characters that distinguish *G. pulchra* from *G. Burbidgei*, it will be observed, are not very striking; the species now figured is provided with neuter organs at the base of the spadix where in *G. Burbidgei* there are none; on the other hand, *G. Burbidgei* has neuter organs situated between the male and female portions of the spadix, a situation in which there are no neuter organs in *G. pulchra*. The stigmas of *G. pulchra* are red, whereas in *G. Burbidgei* they are greenish yellow, but the most marked distinction between the two plants, from the cultural standpoint, lies in the colour of the spathe which in *G. pulchra* is much deeper and brighter red than in *G. Burbidgei*. The localities from which the two species have been reported are somewhat remote; *G. pulchra* comes from the Malayan Peninsula, and has not, so far, been met with in Borneo. Mr. H. N. Ridley has kindly informed us that *G. pulchra* comes from the rocky stream on Gunong Pulai in Johor. Gunong Pulai is the most eastern peak in the range of which Gunong Panti, the original habitat of *Piptospatha Ridleyi*, is the most western hill.

Description.—*Herb*, perennial, everywhere glabrous. *Leaves* suberect, petioled; blade $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{2}$ in. wide, lanceolate, acute, base cuneate, green above, paler beneath; petiole 2–$3\frac{1}{2}$ in. long, terete, channelled, base shortly but broadly sheathing. *Peduncles* erect, about $5\frac{1}{2}$ in. long, terete, reddish brown. *Spathe* almost nodding, ellipsoid, acute, convolute, opening only at the top, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $\frac{3}{4}$ in. wide, bright crimson. *Spadix* hardly more than half as long as the spathe, included, cylindric, obtuse, the female portion hardly more than half as long as the male, beset at the base with yellowish green pistillodes, passing abruptly to the male portion without intervening staminodes. *Anthers* oblong, compressed, truncate, with 2 apical pores, yellowish. *Ovaries* oblong, 1-celled, truncate, united; the stigmas sessile, pink; ovules numerous, erect, almost orthotropous, attached to 2 short basal and partly parietal placentas.

Fig. 1, spadix with the spathe removed; 2, stamen; 3, ovaries; 4, an ovary in longitudinal section; 5, ovule; 6, sketch of an entire plant:—1–5 *enlarged*, 6 *much reduced*.

S. del J.N.Fitch lith.

Vincent Brooks Day & Son Ltd. imp

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TAB. 8331.

PSORALEA AFFINIS.

South Africa.

LEGUMINOSAE. Tribe GALEGEAE.

PSORALEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 491.

Psoralea affinis, *Eckl. et Zeyh. Enum.* p. 224; affinis *P. pinnatae*, Linn., sed pedunculis elongatis foliis aequilongis et calycis lobis obtusissimis utrinque dense nigro-hirsutis differt.

Frutex; rami quadrangulares, glabri vel parcissime pilosi, conspicue resinoso-punctati; ramuli floriferi procumbentes, usque ad 25 cm. longi, plus minusve angulares, circiter 3 mm. diametro, glabri vel novelli parce nigro-pilosi. *Folia* imparipinnata, 3–4-juga, petiolo communi 3–4 cm. longo supra anguste canaliculato parce piloso; foliola opposita, breviter petiolulata, linearia, acuta, 4–5 cm. longa, 2–3 mm. lata, 1-nervia, coriacea, glabrescentia, nigro-punctata; petioluli carnosi, pubescentes, 1 mm. longi; stipulae carnosae vel coriaceae, ovato-lanceolatae, acutae, majores 4 mm. longae. *Pedunculi* axillares, 1-flori, apices ramulorum versus conferti, foliis aequilongi, pubescentes, bracteis bilabiatis calycinis apicalibus instructi. *Calycis* tubus subcampanulatus, 6 mm. longus, 5 mm. diametro, conspicue resinoso-glandulosus, extra 10-costatus, costis dense nigro-pilosis; calycis lobi oblongo-ovati, apice rotundati, 4 mm. longi, 3 mm. lati, utrinque dense nigro-hirsuti. *Corolla* coerulea nisi carina apicem versus atro-purpurea; vexilli limbus latissime obovatus, apice truncatus, emarginatus, 1·5 cm. latus, multistriatus, utrinque glaber, ungue 4 mm. longo; alae oblongo-ellipticae, apice rotundatae, 1–3 cm. longae, 6 mm. latae, unguibus 7 mm. longis; carina obtusa, alis fere aequilongi. *Tubus staminalis* 1·2 cm. longus. *Ovarium* 3 mm. longum, glabrum; stylus gracilis, 1 cm. longus, glaber, stigmate parvo globoso.—*P. pinnata*, var. *subglabra*, Harv. in Harv. & Sond. Fl. Cap. vol. ii. p. 145.—J. HUTCHINSON.

The plant here figured has long been grown in gardens under the name of *Psoralea pinnata*, itself an old garden plant which is stated in the Hortus Kewensis to have been in cultivation at Hampton Court so long ago as 1690. When Ericas and other South African shrubs were more in favour than they are at present, *P. pinnata* was a favourite greenhouse plant, and it is by no means improbable that then, as now, the two forms were in cultivation without being distinguished from each other. The right of the form here figured to separate recognition was pointed out by Ecklon and Zeyher more than seventy years ago, and although the late Dr. Harvey was led to treat *P. pinnata*,

somewhat comprehensively, as a species with four distinct varieties of which our plant is one, Mr. Hutchinson points out that the characters which distinguish the two are such as to justify their segregation, not merely from the standpoint of the cultivator, but from that of the taxonomist. The peduncles of *P. pinnata* are exceedingly short, its calyx-lobes are ovate-lanceolate, acute and subglabrous, while the indumentum is much less dense than in *P. affinis*, which has peduncles as long as the leaves, a strongly 10-ribbed calyx tube, and short, rounded, very densely hirsute calyx lobes. The true *P. pinnata* is widely spread in South Africa from the Cape Peninsula to Algoa Bay. The plant here figured has a more restricted range and has been met with only in the divisions of George, Knysna, Uniondale and Uitenhage. In most parts of England *P. affinis* can only be grown as a pot plant, when it may be made to form bushes 3 feet or so in height, or planted in the border of a sunny greenhouse, when it soon becomes a large Cassia-like shrub reaching 10 feet high; at Kew it flowers in early spring and forms a very attractive object in the Conservatory and the Temperate House. The specimen from which our plate has been prepared came, however, from the garden of Mr. T. A. Dorrien Smith, Tresco Abbey, Isles of Scilly, where the plant is quite hardy in the open and flowers in April.

Description.—*Shrub*; branches 4-angled, glabrous or sparingly hairy, with resinous glands; flowering twigs procumbent, up to 10 in. in length, more or less angled, about $1\frac{1}{2}$ lin. thick, glabrous or at first sparingly pilose with black hairs. *Leaves* odd-pinnate; leaflets opposite, 3–4-paired, shortly stalked, linear, acute, $1\frac{3}{4}$–2 in. long, 1–$1\frac{1}{2}$ lin. wide, 1-nerved, coriaceous, soon becoming glabrous, dotted with black glands; leaf-rachis $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, narrowly channelled above, sparingly hairy; petiolules fleshy, pubescent, $\frac{1}{2}$ lin. long; stipules fleshy or coriaceous, ovate-lanceolate, acute, the largest 2 lin. long. *Peduncles* axillary, 1-flowered, clustered at the ends of the branches, as long as the leaves, pubescent, with two terminal bilabiate calycine bracts. *Calyx* with a subcampanulate tube 3 lin. long, $2\frac{1}{2}$ lin. wide, with conspicuous resinous glands, 10-ribbed externally, the ribs densely hirsute with black

hairs; lobes oblong-ovate with rounded tips, 2 lin. long, $1\frac{1}{2}$ lin. wide, densely hirsute on both sides with black hairs. *Corolla* blue, with a dark purple keel-tip; standard-limb wide obovate, tip truncate emarginate, 8 lin. wide, glabrous, claw 2 lin. long; wings oblong-elliptic, rounded, 6 lin. long, 3 lin. wide; keel obtuse almost as long as the wings. *Staminal* tube 6 lin. long. *Ovary* $1\frac{1}{2}$ lin. long, glabrous; style slender, 5 lin. long, glabrous; stigma small, globose.

Fig. 1, calyx laid open, with pistil; 2, base of vexillum; 3, wing and keel petals; 4, pistil; 5, section of ovary:—*all enlarged.*

Tab. 8332.

RHODODENDRON Ungernii.

Caucasus.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (Eurhododendron) **Ungernii**, *Trautv. in Acta Hort. Petrop.* vol. ix. (1884), p. 514; *Regel*, *Gartenflora*, vol. xxxiv. (1885), p. 335 *et* vol. xxxv. (1886), pp. 378, 1226; *Lipsky*, *Consp. Fl. Cauc. in Acta Hort. Tiflis*, vol. iv. p. 382; inter species caucasicas foliis oblongo-oblanceolatis rigide apiculatis subtus densissime fulvo-tomentosis et floribus dilute roseis distinctum.

Frutex vel *arbor* parva, 4–6 m. alta, ramis floriferis crassis rigidis rectis primum pubescentibus. *Folia* valide petiolata, sparsa, biennia vel triennia; lamina crasse coriacea, rigida, oblongo-oblanceolata, 10–15 cm. longa, maxima supra medium 5 cm. lata, apice rotundata simul apiculata, basi cuneata, supra glabra, saturate viridia, subtus densissime firmiterque fulvo-tomentosa, costa supra impressa, subtus crassa, elevata, venis utrinque inconspicuis; petiolus crassus circiter 2 cm. longus, primum pubescens, leviter canaliculatus. *Flores* albo-rosei, circiter 5 cm. diametro, racemoso-corymbosi, corymbis 20–30-floris et 15–20 cm. diametro; pedicelli graciliusculi, 3–4 cm. longi, pilis albis crispulis parce vestiti; bracteae angustae, acutae, quam pedicelli breviores, fulvae, albo-pilosulae, cito deciduae. *Calycis* lobi inaequales, 3–6 mm. longi, lanceolati, obtusi, glanduloso-ciliati. *Corolla* late campanulata, extra glabra, intus infra medium puberula, usque ad medium 5-lobata; lobi fere aequales, lati, rotundati, obscure emarginati, recurvi, posterior major intus obscure punctatus, omnes longitudinaliter venoso-striati. *Stamina* 10, quam corolla triente breviora, inter se alterna paullo breviora; antherae breves; filamenta filiformia, infra medium et paullo supra basin zona glandularum stipitatarum ornata. *Ovarium* 5-loculare, pilis crassis crispulis dense vestitum; stylus glaber, stamina paullo excedens. *Capsula* subcylindrica, circiter 1·5 cm. longa, glabrescens. *Semina* circiter 1·5 mm. longa, utrinque cristata.—W. B. Hemsley.

The species here figured is a native of the district of Batoum to the south of the Caucasus, where the familiar *Rhododendron ponticum*, Linn., figured at t. 650 of this work, is also wild. It was discovered some twenty-five years ago, by Baron Ungern-Sternberg, growing under *Picea orientalis* at elevations of from 4000 to 6000 feet above sea-level, where it occupies a zone between that of *R. ponticum*, at lower levels, and that of *R. caucasicum*, Pall., figured at t. 1145 of this work, higher up. The subject of our illustration was raised from seed received from the Imperial Botanic Garden, St. Petersburg, in 1866; at Kew it has been grown in a pot under the conditions most

suitable for Himalayan species and is now a bush about 6 feet high, with leathery dark green leaves, smooth above but densely woolly below. It has very rarely flowered; the flowers now figured were produced in July, 1909. Although it has hitherto been afforded protection during winter there is reason to think, when its native habitat and the behaviour of other species from the same region are taken into account, that it may prove hardy in this country.

DESCRIPTION.—*Shrub*, or small tree, 12–20 feet high; flowering twigs straight and stout, at first pubescent. *Leaves* distinctly petioled, alternate, persisting for 2–3 seasons, thickly coriaceous, firm, oblong-oblanceolate, 4–6 in. long, the largest 2 in. wide above the middle, tip rounded and apiculate, base cuneate, glabrous and dark green above, beneath closely and firmly tawny-tomentose, midrib impressed above, strong and raised beneath, lateral nerves inconspicuous on either surface; petiole stout, about $\frac{3}{4}$ in. long, pubescent at first, slightly channelled. *Flowers* pale-rose, about 2 in. across, corymbose, corymbs 20–30-flowered, 6–8 in. through; pedicels somewhat slender, $1\frac{1}{4}$–$1\frac{3}{4}$ in. long, sparingly clothed with crisp white hairs; bracts narrow, acute, shorter than the pedicels, tawny, with a white pubescence which soon disappears. *Calyx-lobes* unequal, $1\frac{1}{2}$–3 lin. long, lanceolate, obtuse, glandular-ciliate. *Corolla* widely campanulate, glabrous outside, within puberulous below the middle, 5-lobed halfway down, the lobes almost uniform, broad, rounded, faintly emarginate, recurved, the uppermost, which is slightly larger than the others, faintly dotted, all distinctly longitudinally veined. *Stamens* 10, one-third shorter than the corolla, alternately shorter and longer; anthers short; filaments filiform, with a band of glandular stipitate hairs below the middle and a little above the base. *Ovary* 5-celled, densely clad with stout crisp hairs; style glabrous, somewhat longer than the stamens. *Capsule* subcylindric, about $\frac{2}{3}$ in. long, almost glabrous. *Seeds* under 1 lin. long, crested at both ends.

Fig. 1, part of a leaf showing undersurface; 2, calyx and pistil; 3, stamens; 4, ovary; 5, section of ovary:—*all, except* 1, *enlarged.*

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Tab. 8333.

CHIRITA rupestris.

Malay Peninsula.

Gesneraceae. Tribe Cyrtandreae.

Chirita, *Ham.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1022; *Clarke in DC. Monogr. Phan.* vol. v. pars 1, p. 109.

Chirita rupestris, *Ridl. in Journ. Str. Br. Roy. As. Soc.* n. 43 (1905), p. 59 *et in King & Gamble, Mat. Fl. Mal. Pen.* iv. 976 (*Journ. As. Soc. Beng.* vol. lxxiv. pars 2, p. 766); inter species in peninsula malayana adhuc obvias *C. Glasgovii*, Ridl., maxime affinis, corolla dimidio breviore facillime tamen distinguenda.

Herba erecta, simplex vel e basi ramosa, 30–60 cm. alta, caule glabrescente. *Folia* opposita, ovata, apice subacuta, basi inaequalia, truncata rotundata vel subcuneata, 5–8 cm. longa, 2·5–6 cm. lata, margine serrata, membranacea, subtus parce farinosa, utrinque pilosa, pilis supra longiusculis multicellularibus subtus brevioribus, nervis lateralibus utrinque circiter 10 subtus prominulis; petioli ad 7 cm. usque longi, pilosi, supra canaliculati. *Pedunculi* axillares, solitarii vel bini, 4–8-flori, 1–3·5 cm. longi; bracteae connatae cupulam pilosam margine crenato-serratam formantes. *Pedicelli* glabri, fere 8 mm. longi. *Calyx* fere ad basin usque partitus, segmentis lineari-lanceolatis circiter 1 cm. longis pilis longiusculis ciliatis. *Corolla* infundibuliformis, intus antice lutea, ceterum azurea; tubus albus, calycem paulo excedens, bracteis aequilongus, intra calycem curvatus, extra et apice intus glanduloso-pilosus; limbus patulus 12 mm. latus. *Stamina* 2; filamenta 7 mm. supra basin tubi inserta; antherae postice barbatae; staminodia 3, quorum 2 filamentis fere aequilonga, alterum perbreve. *Discus* annularis. *Ovarium* pilis adpressis obtectum, 9 mm. altum, 1 mm. diametro; stylus stamina superans; stigma 2-lamellatum.—W. G. Craib.

A marked feature of the species of the natural family Gesneraceae to which the plant here figured belongs is their extremely limited distribution. This pleasing *Chirita* appears to be no exception to this rule, for it has so far only been met with on the limestone rocks of Lankawi which are, it appears, particularly rich in Gesneraceous plants; it is one of the many novelties met with by Mr. C. Curtis, in the course of his botanical investigation of this island, which lies off the coast of Kedah in the Malay Peninsula. It was introduced to European horticulture by Mr. H. N. Ridley, who communicated seeds to Kew from the Singapore Botanical Garden in 1905, the year in which he first published an account of the plant. As cultivated at Kew, in a moist tropical house, it is a

bushy compact annual about 2 feet in height, which flowers freely and continuously during autumn. It is easily brought to perfection under the treatment suitable for Gloxinias and other tropical Gesneraceae.

Description.—*Herb*, erect and simple or branching from the base, 1–2 feet high; stems soon becoming glabrous. *Leaves* opposite, ovate, acute at the tip, often rather unequal and truncate, rounded or slightly cuneate at the base, serrate, 2–3 in. long, 1–2¼ in. wide, membranous, slightly mealy beneath, hairy on both surfaces with several-celled hairs which are longer above than below, lateral nerves about 10 on each side, somewhat raised beneath; petioles 2–2½ in. long, channelled above. *Peduncles* axillary, solitary or paired, each 4–8-flowered, ⅓–1½ in. long; bracts connate in a hairy cup with a crenately toothed margin. *Pedicels* glabrous, about ⅔ in. long. *Calyx* divided nearly to the base into 5 linear-lanceolate lobes about 5 lin. long which are ciliate with longish hairs. *Corolla* funnel-shaped; limb bright blue with a yellow blotch in front within, spreading, ⅔ in. across; tube white, somewhat curved below, as long as the bracts and rather longer than the calyx, glandular hairy outside and at the mouth within.. *Stamens* 2; filaments inserted about ½ in. above the base; anthers bearded behind; staminodes 3, the lateral nearly as long as the filaments, the central very short. *Disk* annular. *Ovary* beset with adpressed hairs; over ½ in. long, only ½ lin. wide; style longer than the stamens; stigma 2-lobed.

Fig. 1, part of a leaf, under side; 2, calyx and pistil; 3, pistil, portion of calyx removed; 4, corolla, laid open; 5 and 6, anthers; 7, an anther-hair:—*all enlarged.*

del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

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Tab. 8334.

TRISTELLATEIA australis.

Malaya and Australasia.

Malpighiaceae. Tribe Hireae.

Tristellateia, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 258.

Tristellateia australis, *A. Rich. Sert. Astrolab.* p. 38, t. 15; foliis ovatis vel ovato-oblongis acutis basi saepius rotundatis glabris aspectu laurino, alis fructuum anguste oblongis distincta.

Frutex scandens, altus. *Ramuli* conspicue lenticellati, juniores pilis medifixis sparse puberuli, seniores glabri, floriferi penduli. *Folia* opposita, ovata vel ovato-oblonga, apice acuta, recurva, basi plerumque rotundata, leviter complicata, 5–10 cm. longa, 2·5–5·5 cm. lata, opaca, glabra, supra nervis lateralibus quam mesophyllo pallidioribus venulis inconspicuis, subtus crebre reticulata costa satis prominente; nervi laterales utrinque 4–5, arcuati; petioli 0·7–2 cm. longi, conspicue sulcati, puberuli, marginibus minute serrulatis; stipulae subulatae, acutae, vix 1 mm. longae, petiolo leviter adnatae. *Racemi* 5–15 cm. longi, 12–16-flori, floribus oppositis pedunculatis: pedunculi 6–7 mm. longi; apice bibracteati, bracteis minutis subulatis; pedicelli singuli, 1·3–1·5 cm. longi, sursum incrassati. *Alabastra* breviter cymbiformia latere postico concavo, quinquecostata. *Sepala* erecta, oblonga, 2·5 mm. longa, 1·5 mm. lata, eglandulosa. *Petala* aestivatione ascendenti-imbricata, oblonga vel ovato-oblonga, 1·1–1·2 cm. longa, apice obtusa, basi truncata vel subcordata, ungue 2 mm. longo. *Stamina* 10, quorum 5 antipetala longiora; filamenta basi breviter connata, in alabastro flava, mox rubescentia, post lapsum antherarum intense rubra, antipetala 4 mm. longa, crassa, antisepala 2 mm. longa, pro rata gracilia; antherae oblongae, breviter rostratae, 2–2·5 mm. longae, poris duabus terminalibus dehiscentes. *Ovarium* hexagono-globosum, circiter 2 mm. diametro, 3-loculare, lateribus antilocularibus cristatis, lateribus interlocularibus sericeo-pilosis; styli 3, inaequales, quorum unus 7 mm. longus, secundus duplo minor, tertius minimus; ovula solitaria, pendula. *Fructus* tricocci, coccis circiter 8-alatis, alis anguste oblongis.—*T. australasica*, A. Juss. Monogr. Malpigh. p. 241; Benth. Fl. Austr. vol. i. p. 286; Hook. f. Fl. Brit. Ind. vol. i. p. 418. *Platynema laurifolium*, Wight et Arn. in Edin. New Phil. Journ. vol. xv. 1833, p. 179.—T. A. Sprague.

The plant here figured was raised at Kew from seeds received in 1902 from the Botanic Garden, Singapore. Its cultivation presents no difficulty and in the Palm House, where it is grown, it forms a strong climber with pendent shoots which in summer produce graceful terminal racemes of yellow flowers. The filaments, which in bud are yellowish, begin to assume a reddish tint when the petals expand and by the time the anthers have fallen become bright red and impart a characteristic appearance to the flowers. One of the most widely distributed members of the natural family Malpighiaceae, *Tristellateia australis* appears to be characteristic of the littoral flora met with on sea coasts from the Mascarenes to Melanesia. While,

however, all save two of the nineteen species of *Tristellateia* hitherto described are natives of Madagascar or East Tropical Africa, *T. australis* appears to occur only in the eastern portion of this region; its most western habitats, so far as is known, are the Malayan Peninsula and Siam, whence it extends eastward through the Malayan Archipelago to Queensland, New Guinea, New Ireland, the Solomon Islands, New Caledonia, the Philippines and Formosa.

Description.—*Shrub*, climbing; twigs with prominent lenticels, at first sparingly puberulous with centrally attached hairs, at length glabrous; flowering shoots pendulous. *Leaves* opposite, ovate or ovate-oblong, acute and recurved at the apex, base usually rounded and somewhat folded, 2–4 in. long, 1–2¼ in. wide, dull, glabrous, lateral nerves above rather pale, secondary nervation indistinct, beneath closely reticulate with a rather prominent midrib; lateral nerves arching, 4–5 on each side; petioles ¼–¾ in. long, markedly channelled, puberulous, with slightly serrulate edges; stipules subulate, acute, slightly adnate. *Racemes* 2–6 in. long, 12–16-flowered, the flowers opposite, peduncled. *Buds* shortly cymbiform, concave behind, 5-ribbed; peduncles 3–4 lin. long, with 2 small apical subulate bracts; pedicels 6–8 lin. long, thickened upwards. *Sepals* small, erect, oblong, eglandular. *Petals* imbricate, oblong or ovate-oblong, 5–6 lin. long, obtuse, base truncate or subcordate, the claw 1 lin. long. *Stamens* 10, 2-seriate, those opposite the petals the longer; filaments shortly connate at the base, in bud yellow, soon becoming reddish and ultimately, after the anthers fall, deep red; those opposite petals 2 lin. long, stout; those opposite sepals 1 lin. long and more slender; anthers oblong, shortly beaked, about 1 lin. long, opening by terminal pores. *Ovary* globose, somewhat 6-angled, about 1 lin. wide, 3-celled; crested opposite the cells, silky hairy on the intervening areas; styles 3, unequal, one 3 lin. long, the second half as long, the third minute; ovules solitary, pendulous. *Fruit* 3-coccous; cocci about 8-winged, the wings narrow oblong.

Fig. 1, petioles; 2, flower, the petals partly removed; 3, a hair; 4 and 5, stamens; 6, pistil; 7, vertical section of pistil, showing the styles:—*all enlarged.*

del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lith. imp

Tab. 8335.

MICROMELES caloneura.

Western China.

Rosaceae. Tribe Pomeae.

Micromeles, *Decne*; *C. K. Schneider, Handb. d. Laubholzk.* vol. i. p. 700.

Micromeles caloneura, *Stapf in Kew Bull.* 1910, p. 192: species ex affinitate *M. Schwerinii*, C. K. Schneider, foliis infra viridibus subglabris serratura minus inaequali et minus acuta, inflorescentia multo minus villosa, floribus majoribus, sepalis latis obtusis, stylis 5, fructibusque majoribus distincta.

Arbor mediocris vel *frutex*; rami glabri, cortice subnitido nigro-castaneo obtecti, parce lenticellati, tandem transverse rugosi. *Gemmae* hibernantes ovoidei extra glabri; perulae intus fulvo-pilosae et ex axillis pilis fulvis stipatae. *Folia* elliptico- vel obovato-oblonga, acuta vel rarius acuminata vel interdum obtusiuscula, basi subacuta, duplicato-serrato-crenata, crenis nervos laterales primarios recipientes quam caeteris plerumque majoribus, 6–9 cm. longa, 3–4·5 cm. lata, firme herbacea, decidua, supra glaberrima, demum saturate viridia, infra pallida, secundum nervos saltem ad eorum axillas parce villosula, nervis lateralibus subrectis eximie parallelis utrinque 10–12 supra eleganter impressis infra prominentibus, venis transversis areolisque tenuissimis; petioli 12 mm. longi, primo laxe pilosi, mox glabri, anguste canaliculati; stipulae subfiliformes, 6–8 mm. longae, pilosae, mox deciduae. *Flores* 6 mm. diametro plerumque in ramis abbreviatis in corymbos multifloros dispositi; ramuli et pedicelli bracteisque caducissimis filiformibus laxe villosuli. *Receptaculum* turbinatum, pilosulum. *Sepala* late ovata, obtusa, vix 2 mm. longa, villosula. *Petala* alba, late obovata, 5 mm. longa. *Stamina* circiter 20; antherae violaceo-purpureae. *Styli* 5, inferne connata. *Fructus* globoso-pyriformis, brunneus, lenticellatus, 8–10 mm. longus.—O. Stapf.

The genus *Micromeles* is already represented in gardens by two beautiful species, *M. alnifolia*, Koehne, and *M. Folgneri*, C. K. Schneider; the former of these has already been figured at t. 7773 of this work. To these the species now figured will prove a welcome addition. It was first met with by Mr. A. Henry in North Wushan, Szechuen, in 1889, and was again collected by Mr. E. H. Wilson in the same general region, in woods at 8000 feet above sea-level, in 1904. From seeds sent by Wilson to Messrs. James Veitch and Sons plants have been raised in their nursery at Coombe Wood and from one of these, which flowered for the first time in 1909, the material for our plate has been derived. *M. caloneura* has proved perfectly hardy and has thriven well in cultivation, and, while it is as yet premature

to pronounce definitely with regard to its propagation, the fact that it has fruited within five years of the sowing of the seed seems to indicate that this should prove easy.

DESCRIPTION.—*Tree* or *shrub*; branches glabrous, bark almost shining, dark chestnut, sparingly lenticelled, ultimately transversely wrinkled. *Resting-buds* ovoid, glabrous; scales tawny hirsute within and with axillary tufts of tawny hairs. *Leaves* elliptic- or obovate-oblong, acute or rarely acuminate or at times bluntish, base subacute, margin twice serrate-crenate, the notches in which the primary nerves end rather larger than the rest, $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. wide, firmly herbaceous, deciduous, quite glabrous and at length deep green above, pale beneath, and sparingly hairy on the nerves, at least at their points of origin; lateral nerves 10–12 on each side, nearly straight and markedly parallel, finely impressed above, prominent beneath, transverse veinlets very slender; petioles $\frac{1}{2}$ in. long, at first loosely hairy, soon glabrous, narrowly channelled; stipules almost filiform, 3–4 lin. long, hairy, soon deciduous. *Flowers* $\frac{1}{4}$ in. across, in many-flowered corymbs on short twigs; the branchlets, pedicels and the filiform caducous bracts loosely pubescent. *Receptacle* turbinate, somewhat hairy. *Sepals* wide ovate, obtuse, under 1 lin. long, rather hairy. *Petals* white, wide obovate, $2\frac{1}{2}$ lin. long. *Stamens* about 20; anthers violet-purple. *Styles* 5, connate below. *Fruit* globose-pyriform, brown, lenticelled, 4–5 lin. long.

Fig. 1, margin of leaf; 2, vertical section of a flower, the petals removed; 3 and 4, stamens; 5, vertical section of a fruit; 6, seed:—*all enlarged.*

S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co. London.

TAB. 8336.

ALECTORURUS YEDOENSIS.

Japan.

LILIACEAE. Tribe ASPHODELEAE.

ALECTORURUS, *Makino in Bot. Mag. Tokyo*, vol. xxii. p. 14.

Alectorurus yedoensis, *Makino in Bot. Mag. Tokyo*, vol. xxii. p. 16; species unica.

Herba perennis, glabra. *Rhizoma* breve, crassum. *Folia* 6–11, caespitosa, disticha, falcato-ensiformia, obtusa vel subacuta, firma, laevia, 11–55 cm. longa, 0·7–2·5 cm. lata, supra vaginam articulata; costa inconspicua. *Scapus* aphyllus, 25–70 cm. longus, compressus, saepe anguste alatus; panicula pyramidalis; flores ad ramos racemosim dispositi, dimorphi, alii staminibus longe exsertis, alii staminibus perianthio aequilongis; bracteae anguste lanceolatae, 2 mm. longae; bracteolae minutae, e basi lato cuspidatae; pedicelli supra medium articulati. *Perianthium* campanulatum, dilute roseum; segmenta 6, 2-seriata, basi breviter connata, florum staminibus exsertis oblonga, concava, obtusa, leviter carinata, uninervia, 5 mm. longa; florum staminibus inclusis late elliptica, 3 mm. longa. *Stamina* 6; filamenta 3 vel 10 mm. longa; antherae dorsifixae, ovatae, basi cordatae. *Ovarium* trilobum, glabrum; stylus stamina longiora superans, staminibus brevibus aequilongus; stigma minutum; ovula 2, collateralia, ascendentia. *Capsula* loculicida. *Semina* oblonga, trigona, basi pilis longis albis instructa.—*Anthericum yedoense*, Maxim. ex Franch. et Sav. Enum. Pl. Jap. vol. ii. pp. 83, 529. *Bulbinella yedoensis*, Matsum. in Bot. Mag. Tokyo, vol. xv. 39, et Ind. Pl. Jap. vol. ii. pars i. p. 192. *Dianella* sp., Sav. in Som. Zusetz. ed. 2, vol. vi. n. 46.—C. H. WRIGHT.

The graceful Asphodeline here figured, which is known in Japan, where it is a native, as the Keibi-ran, or Keibi "orchid," has given some little trouble to students of Japanese plants. The late Dr. Savatier, dealing with a good Japanese figure of the species, at first thought that it might be a *Dianella* but subsequently abandoned this opinion in favour of that of the late Mr. Maximowicz who treated it as an *Anthericum*; it is under the name *Anthericum yedoense*, bestowed on the plant by this eminent botanist, that the plant is generally known in gardens. Professor Matsumura, with ample reason, at a later date removed the plant from *Anthericum*, but, as Mr. Makino has more recently shown, Matsumura's belief that our plant

is a *Bulbinella* is not really more tenable than the suggestion of Savatier or of Maximowicz, and there is hardly room for doubt that the most satisfactory course is to adopt Makino's view and to consider it the type of a genus apart. The flowers are dimorphic, each plant bearing one kind only; in one group the stamens are twice as long as the perianth; in the other the stamens are not exserted. It is not improbable that this divergence may be of sexual significance and it has been suggested that the long-staminate form, here figured, may be the male. The plant from which our plate has been prepared was presented to Kew in 1901 by Mr. A. K. Bulley, Ness, Neston, Cheshire. At Kew it does not flower freely but is quite hardy, and forms, when in flower in July, an elegant tuft. The treatment most suitable for it is that which is also suitable for hardy species of *Anthericum*.

Description.—*Herb*, perennial, with a short thick root-stock; all parts glabrous. *Leaves* 6–11, tufted, distichous, falcate-ensiform, obtuse or subacute, firm, smooth, 4–20 in. long, $\frac{1}{3}$ lin. wide, articulate with the sheath, midrib hardly distinguishable from the remaining nerves. *Scape* naked, 10–30 in. long, compressed and often narrowly winged, bearing a pyramidal panicle. *Flowers* racemosely set along the panicle-branches, dimorphic, some with far exserted stamens, others with the stamens only equalling the perianth-segments; bracts narrow lanceolate, 10 lin. long; bracteoles very small, cuspidate from a broad base; pedicels jointed above the middle. *Perianth* campanulate, pale rose; segments 6, 2-seriate, shortly united at their bases; those of the long-staminate flowers oblong, concave, obtuse, faintly keeled and 1-nerved, $2\frac{1}{2}$ lin. long; those of the short-staminate flowers wide elliptic, $1\frac{1}{2}$ lin. long. *Stamens* 6; filaments $1\frac{1}{2}$ lin. long in one form, 5 lin. long on the other; anthers dorsifixed, ovate, their bases cordate. *Ovary* 3-lobed, glabrous; style in the long-staminate form longer than the stamens; in the short-staminate form as long as the filaments; stigma minute; ovules 2, collateral, ascending. *Capsule* loculicidal. *Seeds* oblong, 3-gonous, with a basal tuft of long white hairs.

Fig. 1, flowers; 2 and 3, stamens; 4, pistil; 5, sketch of an entire plant, showing habit:—*all enlarged, except* 5, *which is much reduced.*

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Fig. 1, flowers; 2 and 3, stamens; 4, pistil; 5, sketch of an entire plant, showing habit:—*all enlarged, except* 5, *which is much reduced.*

TAB. 8337.

BETULA MAXIMOWICZII.

Japan, Saghalien and Manchuria.

CUPULIFERAE. Tribe BETULEAE.

BETULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 404.

Betula (Betulaster) **Maximowiczii**, *Regel in Bull. Soc. Nat. Mosc.* vol. xxxviii. pars ii. p. 418, t. 6, ff. 1–8; *Winkler in Engl. Pflanzenr., Betulaceae*, p. 89, f. 22, D–F; *Bailey, Cyclop. Amer. Hort.* vol. i. p. 158; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. iv. p. 976, t. 269, f. 6; species distinctissima, foliis ad 15 cm. longis basi profunde cordatis, amentis femineis 2–4 elongatis in racemos dispositis.

Arbor interdum ad 30 m. alta; truncus 0·5–1 m. diametro, cortice papyraceo pallide aurantiaco vel griseo; ramuli fere glabri, cortice nitente brunneo sparse lenticellato. *Folia* late ovata, 8–15 cm. longa, 6–9 cm. lata, apice breviter et abrupte acuminata, basi profunde cordata, glanduloso-serrata vel biserrata, laete viridia, supra primo pilis erectis vestita, demum glabrescentia, infra ubique sparse pubescentia vel costa et venis primariis pubescentibus exceptis glabra, glanduloso-punctata; venae laterales utrinque 10–12 in dentes ceteris longiores exeuntes; petioli 2–4 cm. longi, glabri vel pubescentes. *Amenta mascula* apice ramulorum fasciculata, anguste cylindracea, 8–12 cm. longa, bracteae rotundatae, breviter ciliatae, glandulis sessilibus paucis instructae. *Amenta feminea* 2–4 in racemos laxos disposita, anguste cylindracea, 3 cm. longa, fructifera 4–8 cm. longa, circiter 1 cm. lata; bracteae maturae glabrae, 4–5 mm. longae, circiter 2·5 mm. latae, 3-lobatae, lobis lateralibus leviter patentibus lobo intermedio multo brevioribus; nuculae vix 2 mm. longae, latissime alatae. —*B. Maximowicziana*, Regel in DC. Prodr. vol. xvi. sect. ii. p. 180; Shirai in Bot. Mag. Tokyo, vol. viii. p. 321, t. 6, ff. 36–38; Sargent, For. Fl. Japan, p. 62; Shirasawa, Ic. Ess. Forest. Japon, text. p. 45, t. 23, ff. 1–8; Mayr, Fremdländ. Wald- u. Parkbäume, p. 449 (*B. Maximowicsiana*).—S. A. SKAN.

The handsome Birch which forms the subject of our plate is remarkable on account of its large and deeply cordate leaves which impart to the species a striking resemblance to some of the Lindens. It was originally met with by the lamented Mr. Maximowicz in the island of Yezo in Japan, in which country it was afterwards collected by Dr. Mayr on the Nikko mountains in Hondo. According to Professor Sargent it ranges northwards through Saghalien into Manchuria. In 1888 the late Mr. J. H. Veitch sent a supply of seed of this tree from Yezo to England, thus for the first time introducing it into Europe, where examples are now to be met with in many establishments. In 1893 Professor Sargent presented to Kew from the Arnold Arboretum a supply of seed received by him from the officers of the Imperial Forest Department of Yezo. From a plant

raised at Kew from this seed the material on which our illustration is based was derived. *B. Maximowiczii* is a member of the small section *Betulaster* in which are included *B. alnoides*, Ham., *B. luminifera*, Winkler, and *B. Baeumkeri*, Winkler, all natives of the Himalaya or of Central and Southern China. The species included in this section are characterised by having the elongated fruiting catkins arranged in racemes, rarely solitary, and by their broad-winged nutlets. The only other Birch in which the leaves are distinctly cordate at the base is *B. ulmifolia*, Sieb. & Zucc. ; from this *B. Maximowiczii* is easily distinguished by its larger, broadly ovate leaves. Dr. Shirasawa describes the wood of our tree as hard, and as showing no difference in the colour of the heart and the sap woods. In Japan, where it is known as Udai-kamba or Saihada-kamba, the timber is used for house-building; fishermen also make torches of the bark, which is said to take fire readily even when wet.

Description.—*Tree*, sometimes attaining a height of 100 feet; trunk $1\frac{1}{2}$–$3\frac{1}{2}$ feet thick; bark pale orange or grey, papery; twigs nearly glabrous, with brown polished sparingly lenticelled bark. *Leaves* broadly ovate, 3–6 in. long, $2\frac{1}{4}$–$3\frac{1}{2}$ in. wide, shortly and abruptly acuminate, base deep cordate, margin glandular serrate or twice serrate, bright green, clothed above at first with erect hairs which soon disappear, beneath glandular punctate and uniformly sparingly pubescent or with pubescent midrib and nerves but glabrous elsewhere; lateral nerves 10–12 on each side ending in marginal teeth rather longer than the rest; petiole $\frac{3}{4}$–$1\frac{1}{2}$ in. long, glabrous or pubescent. *Male catkins* fascicled at the tips of short twigs, narrow cylindric, 3–$4\frac{1}{2}$ in. long; bracts rounded, shortly ciliate, with a few sessile glands. *Female catkins* 2–4 arranged in loose racemes, narrow cylindric, $1\frac{1}{4}$ in. long, in fruit $1\frac{3}{4}$–3 in. long and about 5 lin. wide; bracts when mature glabrous, 2–$2\frac{1}{2}$ lin. long, about $1\frac{1}{4}$ lin. wide, 3-lobed; lateral lobes somewhat spreading, much shorter than the mid-lobe; nutlets under 1 lin. long, wide winged.

Fig. 1, part of a male catkin; 2, male flowers; 3, anther; 4, part of a female catkin; 5, female flower; 6, bract of female flower; 7, pistil; 8, margin of mature leaf; 9, bract of fruiting catkin; 10, winged nutlet:—*all enlarged.*

L.S. del. J.N. Fitch lith

Vincent Brooks, Day & Son Lt.d imp

L. Reeve & Co. London

Tab. 8338.

ROSA Moyesii.

Western China.

Rosaceae. Tribe Roseae.

Rosa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa Moyesii, *Hemsl. et E. H. Wilson in Kew Bull.* 1906, p. 159; species ex affinitate *R. macrophyllae*, a qua differt foliis aculeatis, foliolis creberrime serrulatis, floribus subsolitariis sanguineis et fructu majore cum calycis lobis persistentibus erectis circiter 6 cm. longo.

Frutex 2·5–3·5 m. altus; rami glabri parce aculeati, aculeis brevibus rectis basi dilatatis. *Folia* 7–13 foliolata, cum petiolo brevi 8–18 cm. longi, 4–7·5 cm. lati, rhachi gracillima aculeolata puberula simul inconspicue glandulosa; foliola praeter terminale subsessilia, tenuia, ovata, oblonga, elliptica vel interdum fere orbicularia, 0·5–3 cm. longa, deorsum gradatim minora, creberrime calloso-serrulata, praeter costam infra pilosulam utrinque glabra, subtus pallidiora; stipulae rubentes, latae, integrae, 1·5–2 cm. longae, minute ciliolato-glandulosae, parte libera deltoidea vix acuta. *Flores* saturate rubro-sanguinei, petalis extra pallidioribus, 4·5–6·5 cm. diametro, solitarii vel bini, erecti; pedunculi quam folia breviores glandulis longe stipitatis conspicue ornati. *Calyx* languide fusco-purpureus; tubus nudus vel glandulis stipitatis plus minusve vestitus; lobi 5, patentes, e basi ovata caudati, apice dilatati, foliacei, petala fere aequantes, intus tomentosi, extra in partibus aliis obtectis etiam primus tomentosi, rarius pauciglandulosi. *Petala* saepissime 5, fere orbicularia, emarginata, 2–3 cm. lata, explanata, sese leviter obtegentia. *Stamina* numerosissima, filamentis brevissimis, antheris fusco-flavis. *Carpella* 15–20, pilosa, libera, e tubo brevissime exserta. *Fructus* saturate rubro-aurantiacus, ampulliformis, cum calycis lobis nunc erectis 6–7 cm. longus, nonnunquam glandulis paucis stipitatis infra medium instructus; achaenia pilosula.—W. Botting Hemsley.

The strikingly beautiful Rose here figured is a native of the mountains of Szechuan, between Mount Omi and Tatienlu at elevations of from 7000–9000 feet above sea-level. It was first collected by Mr. A. E. Pratt and was subsequently met with by Mr. E. H. Wilson, who also secured ripe seeds on behalf of Messrs. J. Veitch & Sons, in whose nursery at Coombe Wood plants were raised which are now 6–8 feet high. From one of the original plants the flowers and fruits now depicted were supplied by Messrs. Veitch in June and in September, 1909. It may be remarked that in addition to the form here figured there is another with paler flowers which, though also beautiful, is less effective than that here shown. *R. Moyesii* will no doubt require the conditions that have been found to suit

the great majority of roses; a sunny position and a good loamy soil inclining to be of a heavy rather than a light character. Such pruning as may be called for will have to take the form of a thinning out of the older wood; certainly not a general shortening back of the branches. It can be propagated by cuttings made in August and placed in gentle heat. Seeds will also be available, but having regard to the possibility of hybridisation it will be necessary that any seed collected be taken from plants isolated from other roses.

Description.—*Shrub*, 8–10 feet high; branches glabrous, sparingly prickly, prickles short straight with widened bases. *Leaves* with 7–13 leaflets, including the short petiole 3–7 in. long, $1\frac{1}{2}$–3 in. wide, rachis very slender, puberulous, with also small prickles and minute glands; leaflets except the terminal almost sessile, thin, ovate, oblong, elliptic or at times almost orbicular, $\frac{1}{4}$–$1\frac{1}{4}$ in. long, gradually smaller towards the basal pair, closely serrulate with thickened teeth, glabrous on both sides except on the slightly pilose midrib beneath, bright green above, paler beneath; stipules wide, entire, $\frac{1}{2}$–$\frac{3}{4}$ in. long, reddish, finely glandular-ciliate, the free tips deltoid, subacute. *Flowers* deep blood-red, the petals paler outside, $1\frac{3}{4}$–$2\frac{1}{2}$ in. across, solitary or in pairs, erect; peduncles shorter than the flowers, clothed with conspicuous long-stalked glands. *Calyx* faintly tinged with dull purple; tube naked or more or less clothed with stalked glands; lobes 5, spreading, caudate from an ovate base, leafy, almost as long as the petals, within tomentose, at first also hairy outside on the portions overlapped in bud by adjacent sepals, rarely slightly glandular. *Petals* usually 5, almost orbicular, emarginate, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide, explanate, slightly overlapping. *Stamens* very many, filaments very short, anthers tawny-yellow. *Carpels* 15–20, pilose, free, somewhat exserted from the tube. *Fruit* deep orange-red, ampulliform, crowned by the calyx lobes which become erect and including these $2\frac{1}{4}$–$2\frac{1}{2}$ in. long, sometimes sparingly clothed with stalked glands below the middle; achenes somewhat pilose.

Fig. 1, longitudinal section of a flower from which the calyx-lobes and petals have been removed; 2, a stamen; 3, a carpel; 4, a ripe fruit; 5 and 6, achenes:—*all, except* 2 and 5, *enlarged.*

M. S. del. J. N. Fitch lith.

Vincent Brooks, Day & Son Lith. Imp.

L. Reeve & Co. London.

Tab. 8339.

STYRAX Hemsleyanus.

Central China.

Styracaceae.

Styrax, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 669; *Perkins in Engl. Pflanzenr., Styracaceae*, p. 17.

Styrax Hemsleyanus, *Diels in Engl. Bot. Jahrb.* vol. xxix. p. 530; *Perkins* l. c. p. 70; affinis *S. glabrescenti*, Benth., sed foliis saepe denticulatis floribus minoribus plerumque in paniculis dispositis differt.

Arbor 6–10 m. alta, cortice albo insigne instructa (fide *A. Henry*); rami subteretes, primum stellato-tomentelli, demum glabri et cinereo-fusci. *Folia* alterna vel subopposita, ambitu polymorpha, plerumque late obovato-elliptica vel oblique ovata, apice obtusa vel subacuta, interdum breviter acuminata, basi rotundata vel subcuneata, 7–13 cm. longa, 4–10 cm. lata, tenuiter chartacea vel membranacea, denticulata, supra glabra, subtus costa nervisque parce stellatim pilosa ceterum glabra, nervis lateralibus 5–8 prope marginem anastomosantibus, nervis transversis subparallelis. *Inflorescentia* 8–15 cm. longa, racemosa vel paniculata, axillaris vel terminalis, 8–20-flora; rhachis adpresse stellatim rufo-tomentella, demum subglabra; bracteae minutae, tomentellae, caducae. *Flores* 1·5–2 cm. longi, 2–3 cm. diametro; pedicelli ad 5 mm. longi, stellato-tomentelli. *Calycis* tubus cupuliformis, 5–6 mm. altus, 4 mm. diametro, 5–6-dentatus, leviter costatus, extus rufo-stellato-tomentellus, dentibus acutis 1–2 mm. longis. *Corolla* alba, 5-partita; tubus 4–5 mm. longus, lobis imbricatis elliptico-lanceolatis 1–1·5 cm. longis 5–7 mm. latis submembranaceis utrinque adpresse albido-stellato-tomentellis. *Stamina* 10, corollae lobis breviora, filamentis complanatis cum antheris parce stellato-pilosis. *Ovarium* ovoideum, dense albo-tomentosum, triloculare, multiovulatum; stylus glaber, corollae lobis paulo brevior. *Fructus* obovoideus, 2 cm. longus, 1·3 cm. diametro, exocarpio tomentello, stylo basi persistente breviter mucronatus, calyce persistente.—J. Hutchinson.

The *Styrax* here figured was discovered by Mr. A. Henry in Szechuan and Hupeh in 1888, and again met with in Szechuan by Mr. E. H. Wilson, who sent seeds to Messrs. J. Veitch & Sons. From a plant raised from these seeds, now a vigorous small tree of slender pyramidal form and about 9 feet high, in the Coombe Wood Nursery, which flowered in June, 1909, the material for our figure was derived. The leaves are of a pale bright green, and of striking size. Henry notes this species as being, in a wild state, 30 feet high, with white, fragrant flowers and remarkable white bark. It bears a general resemblance in habit and flower to *S. Obassia*, Sieb. & Zucc., a Japanese species sometimes met with in collections, figured at t. 7039 of this work, but differs from that species in

that the bud is not enclosed by the base of the petiole, the leaves are nearly always contracted at the base, more finely toothed and glabrous or nearly so underneath, while the inflorescence is branched at the base and the fruits are abruptly contracted and mucronate at the tip. *S. Hemsleyanus* is not closely related to any species from Eastern Asia; its nearest ally appears to be the Mexican *S. glabrescens*, Benth. It thrives well in open loamy soil and promises to be hardy; for young plants, a proportion of one-third peat added to ordinary soil, about their roots, will probably be found advantageous.

Description.—*Tree*, reaching a height of 20–30 feet, with remarkable white bark; branches almost cylindric, at first slightly stellate-hairy, at length glabrous and tawny. *Leaves* alternate or almost opposite, usually wide obovate-elliptic or obliquely ovate, obtuse or subacute, occasionally shortly acuminate, base rounded or almost cuneate, $\frac{3}{4}$–5 in. long, $1\frac{3}{4}$–4 in. wide, rather thin, denticulate, glabrous above, beneath sparingly stellate-pubescent on midrib and nerves, elsewhere glabrous; main nerves 5–8 on each side anastomosing near margin, transverse veins nearly parallel. *Inflorescence* 3–6 in. long, racemose or almost paniculate, axillary or terminal, 8–20-flowered; rachis at first with a close stellate pubescence, at length nearly glabrous; bracts minute, tomentose, caducous. *Flowers* 8–10 lin. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. across; pedicels 2 lin. long, stellate-pubescent. *Calyx* cup-shaped, 5–6-toothed; tube $2\frac{1}{2}$–3 lin. deep, 2 lin. wide, faintly ribbed, rusty stellate-tomentose outside; teeth acute, 1 lin. long or less. *Corolla* white, 5-partite; tube 2–3 lin. long; lobes imbricate, elliptic-lanceolate, 5–8 lin. long, $2\frac{1}{2}$–$3\frac{1}{2}$ lin. wide, almost membranous, closely white stellate-tomentose without and within. *Stamens* 10, shorter than corolla lobes; filaments flattened, sparingly clothed, like the anthers, with stellate hairs. *Ovary* ovoid, densely white tomentose, 3-celled, many-ovuled; style glabrous, somewhat shorter than corolla lobes. *Fruit* obovoid, 10 lin. long, 6 lin. wide; exocarp somewhat pubescent; apex tipped with the persistent style-base; calyx in fruit persistent.

Fig. 1, calyx and pistil; 2, stellate hairs; 3, corolla, laid open, and stamens; 4 and 5, anthers; 6, pistil:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son

Tab. 8340.

IRIS Wilsonii.

China.

Iridaceae. Tribe Irideae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris Wilsonii, *C. H. Wright in Kew Bull.* 1907, p. 321; affinis *I. sibiricae*, Linn., sed pedicellis et spathis herbaceis longis, floribus plerumque luteis distincta.

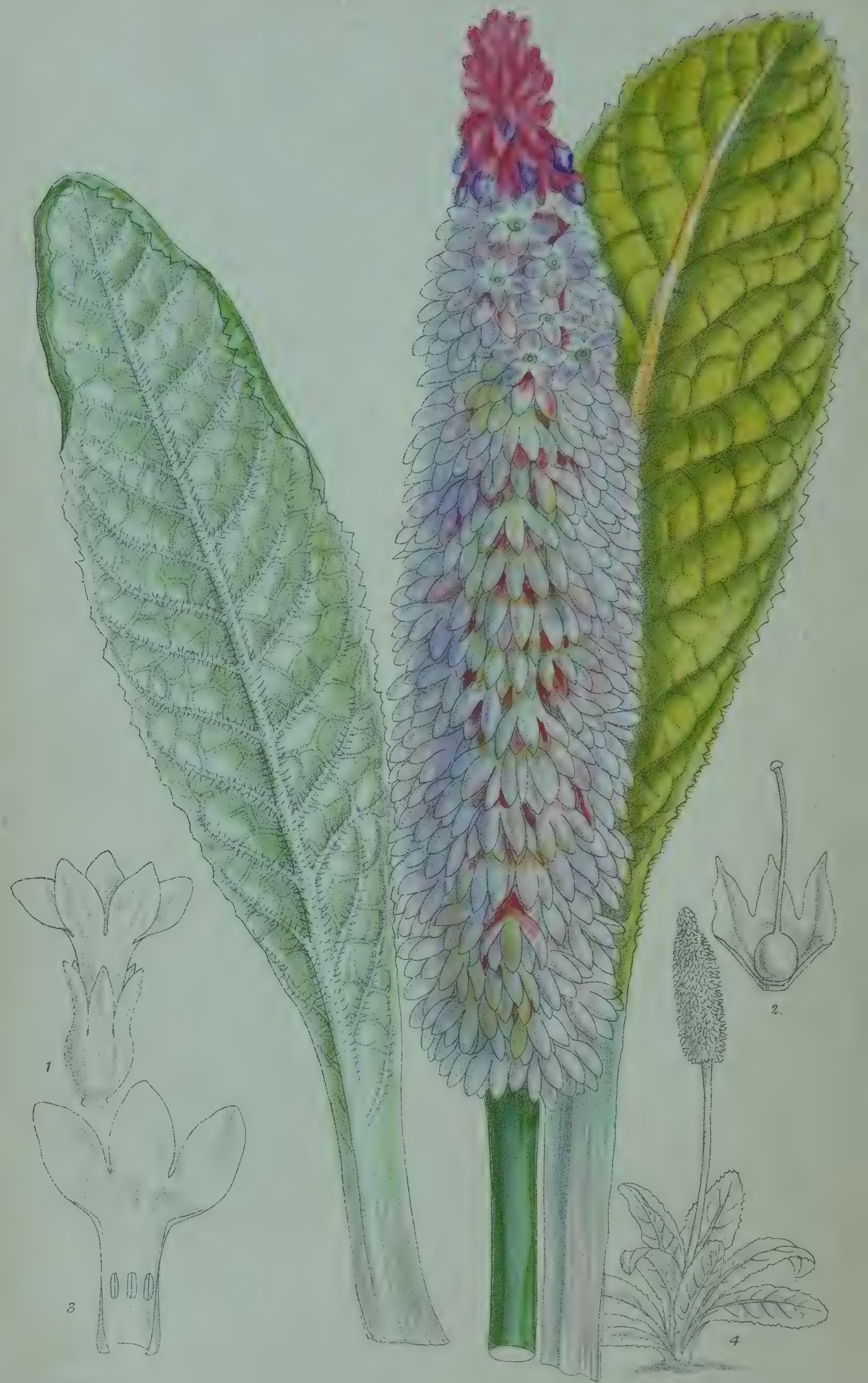
Herba rhizomate brevi, collo ob vaginas vetustas solutas fibroso. *Folia* basalia 30–60 cm. longa, 5–6 (rarius ad 9) mm. lata, apice brevi oblique subincurvo, laete viridia, laevia, saltem inferne inaequaliter nervosa, nervis mediis 3–4 quam ceteris magis prominentibus et conspicuis. *Caulis* 20–30 cm. altus, cylindricus, 1-foliatus, folio circiter 15 cm. longo infra medium orto foliis basalibus simili, 2–1-florus. *Spathae* magis minusve herbaceae, una saepe in laminam perbrevem abiens, 6–10 cm. longae, 2–4 mm. latae. *Pedicelli* inaequales, longiores, ad 13 cm. longi. *Perianthii* tubus viridis, 8–10 mm. longus, obtuse trigonus; segmenta exteriora 4–5 cm. longa limbo reflexo oblongo- vel obovato-elliptico 1·5–2 cm. lato luteo infra medium purpureo-venoso, ungue quam limbo paulo breviore 7–9 mm. lato margines versus copiose purpureo-venoso; segmenta interiora oblongo-lanceolata in unguem gracilem attenuata, 2–3·5 cm. longa, 6–8 mm. lata, lutea. *Filamenta* 9–11 mm. longa; antherae albidae, 11–12 mm. longae. *Ovarium* obtuse triquetrum, sub anthesi 1·5–1·8 cm. longum; styli rami subspathulato-lineares, superne 7–8 mm. latae, luteae, cristae lobis late ovatis eroso-denticulatis; stigmate late triangulari. *Capsula* triquetra, oblonga, utrinque breviter attenuata, 3–3·5 cm. longa. *Semina* oblique triquetro-ovoidea, apice truncata, nigro-fusca, 4–5 mm. longa.—O. Stapf.

The Iris here figured was discovered by Mr. E. H. Wilson in Western China on behalf of Messrs. J. Veitch & Sons, and the material on which our figure is based was supplied from a plant which flowered with them in July, 1909. Another plant, presented by them to Kew, also flowered simultaneously in the Iris collection, where it has grown freely under the conditions suitable for the well-known *I. sibirica*, Linn., which it resembles in habit. It appears to be quite hardy, and promises to prove a useful addition to the list of garden Irises. In 1907 Mr. Wilson rediscovered this plant in Western Hupeh, growing in grasslands near Fang Hsien, at about 7000 feet above sea-level. But in addition to the form here figured there is another and nearly related form, which flowered with Messrs. Veitch in 1907, collected by Mr. Wilson on their behalf at Fang in Central China, of more robust habit and with wider spathes which extend as far as or beyond the top of the perianth-

tube. This stouter form has been distinguished by Mr. Wright as a variety, var. *major*, of *I. Wilsonii*, but the venation of the leaves is somewhat different, and it may be necessary, when more ample material is available, to treat this robust plant as a distinct species. As gathered in a wild state and also under cultivation all the specimens of Mr. Wilson's two plants have pale yellow flowers. But it has to be remarked that in 1906 Mr. G. Forrest collected, on the eastern flank of the Tali range in Western Yunnan, an Iris with bright purplish-blue flowers as in *I. sibirica*, but which only differs from *I. Wilsonii* in other respects in having more finely acute leaves and wider perhaps less herbaceous spathes. This blue form is met with in mountain pastures at 10,000 feet above sea-level.

Description.—*Herb*, rhizome short, its apex crowned with the fibrous remains of the leaf-sheaths. *Leaves* at the base 1–2 feet long, 3–4 lin. wide, the tip short, slightly obliquely incurved, bright green, smooth, unequally veined at least in the lower portion, 3–4 of the nerves towards the centre more prominent than the others. *Stem* 8–12 in. high, 2- or 1-flowered, cylindric, 1-foliate, the leaf about 6 in. long and arising below the middle, like the basal leaves except as regards its size. *Spathes* somewhat herbaceous, one usually produced in a short blade, $2\frac{1}{4}$–4 in. long, 1–2 lin. wide. *Pedicels* unequal, the longer reaching 5 in. in length. *Perianth-tube* green, 4–5 lin. long, bluntly 3-gonous; outer segments nearly 2 in. long, with a reflexed, oblong- or obovate-elliptic limb 8–10 lin. long, veined with purple below the middle, claw somewhat shorter than the limb, 3–5 lin. wide, copiously veined with purple towards the edge; inner segments oblong-lanceolate, narrowed to a slender claw, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, 3–4 lin. wide, yellow. *Filaments* 5–6 lin. long; anthers whitish, rather longer than the filaments. *Ovary* bluntly 3-cornered, in flower 8–9 lin. long; style-arms subspathulate-linear, 3–4 lin. wide above, yellow, lobes of the crest wide ovate, erosely toothed; stigma wide triangular. *Capsule* triquetrous, oblong, slightly narrowed to both ends, $1\frac{1}{4}$–$1\frac{3}{4}$ in. long. *Seeds* oblique, triquetrous-ovoid, truncate at the tip, dark-tawny, 2–$2\frac{1}{2}$ lin. long.

Figs. 1 and 2, anthers; 3, a lobe of the stigma; 4, fruit; 5, seeds:—*all, except* 4, *enlarged.*



M.S.del. J.N.Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

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Tab. 8341.

PRIMULA Littoniana.

Western China.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Littoniana, *G. Forrest in Not. Roy. Bot. Gard. Edin.* 1908, pars xix. p. 225, cum icon.; ab affini *P. Viali*, Delavay ex Franch., partibus omnibus multo majoribus, calycis lobis tubo aequalibus, satis distincta videtur.

Herba perennis, 30–60 cm. alta. *Folia* omnia radicalia, anguste oblonga, obtusa, inferne longissime attenuata, ad 20 cm. longa, 7 cm. lata, irregulariter dentata, ciliata, utrinque pilosa, subtus praeterea in costa araneoso-pilosa, nervis secundariis utrinque numerosis, obliquis; petioli circiter 9 cm. longi. *Scapi* erecti, robusti, 40–60 cm. alti, folia longe superantes, basi glabri, supra parcissime farinosi, spicas simplices densas multifloras 7–12 cm. longas, 2·5–3·5 cm. diametro gerentes. *Flores* violaceo-coerulei, reflexi; bracteae lineares parce farinosae. *Calyx* late campanulatus vel globoso-campanulatus; tubus 2 mm. longus; lobi coccinei, ovato-lanceolati, subacuti, 4 mm. longi, 2·5 mm. lati. *Corollae* tubus circiter 1 cm. longus, 2 mm. diametro, calycem multoties superans; limbus concavus 6–8 mm. diametro, lobis late lanceolatis integris apice obtusis 4 mm. longis, 2·5 mm. latis. *Capsula* globosa, parva, calyce inclusa.—W. G. Craib.

The *Primula* here figured was collected in Yunnan by Mr. G. Forrest on behalf of Messrs. Bees, of Neston; the plant depicted was acquired from that firm in August, 1909. In Cheshire this species seems hardy, and plants grown in the open at Kew were uninjured by the frosts of the past winter. *P. Littoniana* belongs to a group of forms nearly allied to one sent to Paris by the late Père Delavay under the name *P. Viali*. It is not clear what the relationship of the different forms in this group may be. Mr. Franchet, who formally described Delavay's species, associated therewith a plant found in Szechuan by Père Soulie, which has bilobulate corolla segments in place of the entire lobes that characterise the plant named by Delavay. Messrs. Pax and Knuth refer to *P. Viali* yet another Primula collected by Mr. Ford in China. As regards the last-mentioned plant it has to be remarked that, in the Kew collection, Ford has included under the same field number two forms; one refer-

able to *P. deflexa*, Duthie, but hardly distinguishable from the plant figured by Pax and Knuth as *P. Viali*, the other not distinguishable from the Eastern Himalayan *P. bellidifolia*, King. But Ford's two plants, though distinguishable, are so nearly related that his opinion, based on field observation, as to their specific identity may be correct; by parity of reasoning there is nothing improbable in the views of Pax and Knuth and of Franchet respectively, or in a suggestion that all these forms may be referable to one variable species first named *P. bellidifolia* by the late Sir George King. This being so, it is not surprising that so experienced a field observer as Mr. E. H. Wilson should consider the plant here figured to be only a strong form of *P. Viali*, Delavay. On the other hand, photographs of *P. Littoniana*, taken in the field, indicate a degree of uniformity among the particular plants involved that does not admit of being lightly put aside, so that, in spite of the fact that the differential characters pointed out by Mr. Craib are far from convincing, it is convenient, from the gardening standpoint, to treat *P. Littoniana* and *P. Viali*, for the moment, as distinct.

Description.—*Herb*, perennial, 1–2 feet high. *Leaves* all radical, narrow oblong, obtuse, much narrowed to the base, up to 8 in. long, 3 in. wide, irregularly toothed, ciliate, hairy on both surfaces and cobwebby beneath, especially along the midrib, secondary nerves many, oblique; petiole about $3\frac{1}{2}$ in. long. *Scapes* erect, stout, $1\frac{1}{2}$–2 feet high, rising far above the rosette, glabrous below, very sparingly mealy above, ending in dense, simple, many-flowered spikes which are 3–5 in. long and 1–$1\frac{1}{2}$ in. across. *Flowers* violet-blue, reflexed; bracts linear, sparingly mealy. *Calyx* wide campanulate or globose-campanulate; tube 1 lin. long; lobes pink, ovate-lanceolate, somewhat acute, 2 lin. long, $1\frac{1}{4}$ lin. wide. *Corolla* much larger than the calyx; tube about 5 lin. long, 1 lin. across; limb concave, 3–4 lin. across; lobes broadly lanceolate, entire, obtuse, 2 lin. long, $1\frac{1}{4}$ lin. wide. *Capsule* globose, small, enclosed in the calyx.

Fig. 1, flower; 2, section of calyx, showing pistil; 3, section of corolla, showing anthers; 4, sketch of an entire plant:– *all enlarged except* 4, *which is much reduced.*

able to *P. deflexa*, Duthie, but hardly distinguishable from the plant figured by Pax and Knuth as *P. Viali*, the other not distinguishable from the Eastern Himalayan *P. bellidifolia*, King. But Ford's two plants, though distinguishable, are so nearly related that his opinion, based on field observation, as to their specific identity may be correct; by parity of reasoning there is nothing improbable in the views of Pax and Knuth and of Franchet respectively, or in a suggestion that all these forms may be referable to one variable species first named *P. bellidifolia* by the late Sir George King. This being so, it is not surprising that so experienced a field observer as Mr. E. H. Wilson should consider the plant here figured to be only a strong form of *P. Viali*, Delavay. On the other hand, photographs of *P. Littoniana*, taken in the field, indicate a degree of uniformity among the particular plants involved that does not admit of being lightly put aside, so that, in spite of the fact that the differential characters pointed out by Mr. Craib are far from convincing, it is convenient, from the gardening standpoint, to treat *P. Littoniana* and *P. Viali*, for the moment, as distinct.

Description.—*Herb*, perennial, 1–2 feet high. *Leaves* all radical, narrow oblong, obtuse, much narrowed to the base, up to 8 in. long, 3 in. wide, irregularly toothed, ciliate, hairy on both surfaces and cobwebby beneath, especially along the midrib, secondary nerves many, oblique; petiole about $3\frac{1}{2}$ in. long. *Scapes* erect, stout, $1\frac{1}{2}$–2 feet high, rising far above the rosette, glabrous below, very sparingly mealy above, ending in dense, simple, many-flowered spikes which are 3–5 in. long and 1–$1\frac{1}{2}$ in. across. *Flowers* violet-blue, reflexed; bracts linear, sparingly mealy. *Calyx* wide campanulate or globose-campanulate; tube 1 lin. long; lobes pink, ovate-lanceolate, somewhat acute, 2 lin. long, $1\frac{1}{4}$ lin. wide. *Corolla* much larger than the calyx; tube about 5 lin. long, 1 lin. across; limb concave, 3–4 lin. across; lobes broadly lanceolate, entire, obtuse, 2 lin. long, $1\frac{1}{4}$ lin. wide. *Capsule* globose, small, enclosed in the calyx.

Fig. 1, flower; 2, section of calyx, showing pistil; 3, section of corolla, showing anthers; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

TAB. 8342.

XERONEMA MOORII.

New Caledonia.

LILIACEAE. Tribe ASPHODELEAE.

XERONEMA, *Brongn. et Gris*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 781.

Xeronema Moorii, *Brongn. et Gris in Bull. Soc. Bot. France*, vol. xi. (1864), p. 316, *in Choix Pl. Nouv. Caled.* t. 1, et *in Nouv. Arch. Mus. Par.* vol. iv. p. 2, t. 1 (1868); species unica.

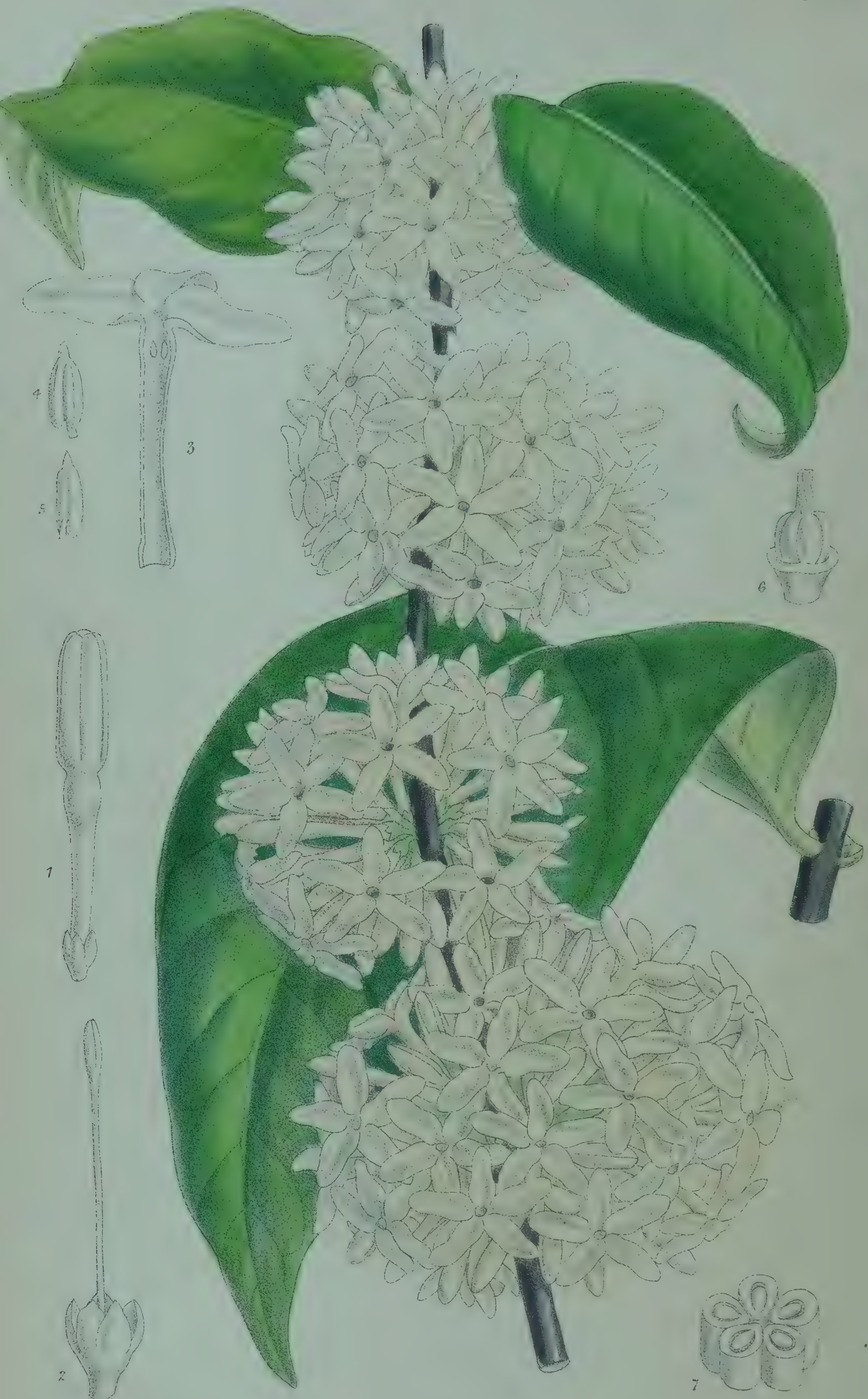
Herba; radice fibrosa, caule brevissimo. *Folia* disticha, vaginantia, ensiformia, lateraliter compressa, 40 cm. longa, 3 cm. lata, glabra, minute punctata. *Scapus* quam folia inferiora paullo longior; racemus 15 cm. longus, abrupte curvatus, rhachi horizontali; bracteae elongatae, vaginantes; flores secundi, erecti, rubro-purpurei; bracteolae scariosae, oblongae, breviter mucronatae, 1 cm. longae, 4 mm. latae; pedicelli 6 mm. longi. *Perianthii* segmenta 6, oblongo-lanceolata, apice anguste cucullata, persistentia, 15 mm. longa, 3 mm. lata, minute maculata. *Stamina* quam perianthium duplo longiora; filamenta rubro-purpurea, subulata; antherae oblongae, introrsae. *Ovarium* oblongum, trilobatum; ovula in quoque loculo 8–10; stylus subulatus, post anthesin spiraliter tortus; stigma parvum, obscure trilobum.—*X. Moorei*, André in Ill. Hort. 1877, p. 184, pl. 297; Ender in Gartenfl. 1878, p. 349; Reuthe in Gartenfl. 1889, p. 408, fig. 69. *Scleronema Moorii*, Brongn. et Gris in Ann. Sci. Nat. 5^{me} sér. vol. ii. p. 166.—C. H. WRIGHT.

The rather striking plant here described is a native of the mountains of New Caledonia, where it grows on volcanic rocks at elevations of from 3–5,000 feet above sea-level. It was originally discovered by Mr. C. Moore, Director of the Sydney Botanic Garden, and was introduced to European horticulture by Mr. J. Linden in 1875. The specimen from which our figure has been prepared was purchased for the Kew Collection from Messrs. J. Veitch & Sons in 1896. The distichous compressed leaves, sheathing at the base, impart to the species a facies recalling that characteristic of many of the *Iridaceae*; the flowers, however, are of a distinctly liliaceous type, and the genus *Xeronema*, to which our plant belongs, together with the Australasian genus *Herpolirion*, Hook. f., which has a quite different habit, constitutes the sub-tribe *Xeroneminae* of the *Asphodeleae* in the Natürlichen Pflanzenfamilien of Engler & Prantl. In cultivation it calls for the treatment most suitable for

many South African bulbous plants; potted in a peaty soil and kept moderately moist all the year round. It enjoys bright sunshine and flowers annually in June. The perianth segments and filaments persist and retain their colour for a month or more. The subhorizontal direction assumed by the flower-bearing portion of the rachis and the curving of the pedicels so as to bring all the flowers into an approximately erect position are constant features which impart a characteristic aspect to the plant. *Xeronema Moorii* does not ripen seeds in this country; it may, however, be propagated by division.

Description.—*Herb*; stem very short, roots fibrous. *Leaves* distichous, sheathing at the base, ensiform, laterally compressed, $1\frac{1}{2}$ feet long, $1\frac{1}{4}$ in. wide, glabrous, finely dotted. *Scape* rather longer than the lower leaves; raceme 6 in. long, abruptly bent to a nearly horizontal position; bracts elongated, sheathing; flowers secund, erect, reddish-purple; bracteoles scarious, oblong, shortly mucronate, 5 lin. long, 2 lin. wide; pedicels 3 lin. long. *Perianth* 6-lobed; lobes oblong-lanceolate, narrowly hooded at the tip, persisting, 8 lin. long, $1\frac{1}{2}$ lin. wide. *Stamens* twice as long as perianth; filaments reddish-purple, subulate; anthers oblong, dark purple, introrse. *Ovary* oblong, 3-lobed; ovules 8–10 in each cell; style subulate, spirally twisted after the opening of the flower; stigma small, obscurely 3-lobed.

Fig. 1, flower; 2 and 3, anthers; 4, pistil; 5, sketch of an entire plant, showing habit:—*all enlarged except* 5, *which is much reduced*.



M. S. del. J.N. Fitch lith

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TAB. 8343.

PLEIOCARPA MUTICA.

West Africa.

APOCYNACEAE. Tribe PLUMERIOIDEAE.

PLEIOCARPA, *Benth.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 699.

Pleiocarpa mutica, *Benth. in Hook. Ic. Pl.* t. 1181; *Stapf in Thiselton-Dyer, Fl. Trop. Afr.* vol. iv. pars i. p. 98; affinis *P. rostratae*, Benth., sed corolla multo breviore eius lobis brevibus et fructu haud rostrato ovoideo-globoso distincta.

Frutex, 1·5 m. altus, ramis fuscescentibus. *Folia* elliptica vel oblonga, abrupte acuminata, basi acuta vel subacuta, 8–16 cm longa, 3·5–6 cm. lata, tenuiter coriacea, supra lucida, nervis utrinque 11–14; petiolus 6 mm. longus. *Flores* in fasciculos globosos multifloros axillares dispositi, brevissime pedicellati. *Sepala* ovata, obtusa vel subacuta, ad 2 mm. longa. *Corolla* lactea, tubo cylindrico 12–16 mm. longo, lobis ovatis vel oblongis, obtusis, 6–7 mm. longis. *Carpella* 5, uniovulata. *Fructus* baccati, ovoideo-globosi, obtusi vel apiculati, rugosi, 8 mm. longi.—*Hunteria pleiocarpa*, Hallier f., Kautschuklianen in Jahrb. Hamburg. Wissensch. Anstalt. vol. xvii. (1899) 3. Beih. p. 193, partim.—O. STAPF.

The genus *Pleiocarpa*, to which the subject of our plate belongs, is endemic in Tropical Africa, from which region twelve species have so far been reported. The one here figured, *P. mutica*, is a native of the Cameroons, where it was first met with by Mr. G. Mann. It has since been found in Old Calabar, whence it has been introduced to European horticulture. The material made use of in preparing our illustration has been derived from a plant which flowered at Kew in June, 1909; this plant was raised from a cutting received from the Glasgow Botanic Garden in 1902. It has thriven well in a stove under the tropical conditions suitable for species of *Ixora*, and is striking from the cultural standpoint owing to the profusion of its beautiful white flowers. From the morphological point of view it is interesting on account of the presence in the flower of five carpels. This peculiarity it shares with another species, *P. rostrata*, Benth., while in a third species, *P. salicifolia*, Stapf, there are three or four carpels. The remaining species of *Pleiocarpa* have only two carpels, which is the number characteristic of the order Apocynaceae.

NOVEMBER, 1910.

Description.—*Shrub*; 5 feet high; branches somewhat tawny. *Leaves* opposite, elliptic or oblong, abruptly acuminate, base cuneate, 3–6 in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. wide, thinly coriaceous, shining above, nerves 11–14 on each side; petiole 3 lin. long. *Flowers* shortly pedicelled, in axillary many-flowered globose clusters. *Sepals* ovate, obtuse or subacute, about 1 lin. long. *Corolla* pure white; tube cylindric, 6–8 lin. long; lobes ovate or oblong, obtuse, 3–$3\frac{1}{2}$ lin. long. *Carpels* 5, each 1-ovuled. *Fruit* berry-like, ovoid-globose, obtuse or apiculate, rugose, 4 lin. long.

Fig. 1, an unopened flower; 2, calyx and pistil; 3, vertical section of corolla; 4 and 5, anthers; 6, ovary; 7, section of ovary:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son Ltd. imp.

L. Reeve & Co. London.

Tab. 8344.

COLUMNEA Oerstediana.

Costa Rica.

Gesneraceae. Tribe Cyrtandreae.

Columnea, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1009.

Columnea Oerstediana, *Klotzsch ex Oerst. Centralam. Gesner.* p. 61, t. 8; *Hanst. in Linnaea*, vol. xxxiv. p. 407; affinis *C. microphyllae*, Klotzsch & Hanst., a qua foliis supra glabris subtus minute puberulis recedit.

Suffrutex vel *herba* epiphytica caule lignoso subtetragono fuscescente glabro nitidulo ramoso, ramis elongatis, teste Oersted strictis patenti-arrectis, indivisis superne sparse appresse pubescentibus, internodiis 1–1·7 cm. longis. *Folia* opposita, breviter petiolata, late ovata vel ovato-oblonga, apice acuta vel subacuta, basi obtusa vel rotundata, 1–1·5 cm. longa, 7–10 mm. lata, carnosa, supra convexa, saturate viridia, nitidula, glabra, subtus pallida, minute appresse puberula; nervi laterales utrinque 3–4, valde obliqui, subtus conspicui; petioli 2–3 mm. longi. *Flores* axillares, solitarii, erecti. *Pedunculus* circiter 1 cm. longus. *Sepala* erecta, valde imbricata, ovata, caudato-acuminata, inferne repando-dentata, ultra 1·5 cm. longa, 7 mm. lata, extra appresse puberula. *Corolla* coccinea, in toto circiter 7 cm. longa, bilabiata, extra pilis articulatis sparse villosa; tubus angustus, faucem versus sensim ampliatus, 4–4·5 cm. longus, inferne postice gibbosus; labium posticum galeiforme, apice rotundatum vel subcuspidatum; lobi laterales patentes, triangulares, cum galea alte connati; lobus anticus reflexus, lineari-lanceolatus, circiter 1·7 cm. longus. *Stamina* 4, exserta; filamenta glabra; antherae in quadram cohaerentes. *Disci* glandula unica, postica, emarginata. *Ovarium* appresse pubescens; placentae bilamellatae.—T. A. Sprague.

The *Columnea* here described, a native of Costa Rica, like its congener, *C. magnifica*, Klotzsch & Hanst., figured at t. 8225 of this work, does not appear to have been collected since its first discovery fifty years ago. This suggests that many of the Central American Gesnerads may have a limited distribution, and that further exploration of this region may lead to the introduction of forms that are as yet unknown. The plant on which our plate is based flowered in February, 1910, in the collection of Col. R. H. Beddome, Sispara, West Hill, Putney. This plant was a young cutting rooted in a propagating frame and grown in a small pot kept close to the roof-glass of a stove; another plant flowered simultaneously in a stove at Kew. Old plants rarely flower freely, but from the pendent habit assumed by

their branches, which give off small adventitious roots at the nodes, they form effective basket-plants, and bear a considerable resemblance to some of the tropical species of *Aeschynanthus* not only in this respect, but in the character of the foliage and in the aspect of the flowers. It would appear, however, from the account given by Oersted, that under natural conditions this species has a woody stem which gives off long straight spreading branches without adventitious roots.

DESCRIPTION.—*Undershrub* or *herb*, epiphytic; stem woody, somewhat 4-angled, rather tawny, glabrous, freely branched; branches simple, sparingly adpressed pubescent upwards, with internodes 5–9 lin. long, in a wild state, according to Oersted, strict and spreading or upraised, in cultivated plants flexuous and pendent. *Leaves* opposite, shortly petioled, wide ovate or ovate-oblong, acute or subacute, base obtuse or rounded, 5–8 lin. long, 3–5 lin. wide, fleshy, convex and deep green, shining and glabrous above, beneath pale green, and very finely adpressed puberulous; lateral nerves 3–4 on each side, very oblique, distinct beneath; petiole 1–1½ lin. long. *Flowers* axillary, solitary, erect, their peduncles about 5 lin. long. *Sepals* erect, much imbricate, ovate, caudate-acuminate, repandly toothed below, about 8 lin. long, 4 lin. wide, adpressed puberulous outside. *Corolla* pink, nearly 3 in. long, bilabiate, sparingly villous with jointed hairs externally; tube narrow, slightly widened towards the throat, 1½–1¾ in. long, somewhat gibbous at the base behind; upper lip galeate with a rounded or slightly cuspidate tip; lateral lobes spreading, triangular, connate for some distance with the upper lip; lower lip reflexed, linear-lanceolate, about 9 lin. long. *Stamens* 4, exserted; filaments glabrous; anthers cohering. *Disk-gland* solitary, posticous, emarginate. *Ovary* adpressed pubescent; placentas 2-lamellate.

Fig. 1, a pair of leaves; 2, calyx, in vertical section, and pistil; 3, base of a corolla and stamens; 4, a jointed corolla-hair;—*all enlarged.*

M. S. del. J. N. Fitch lith.

Vincent Brooks, Day & Son Lith.

L. Reeve & Co. London.

TAB. 8345.

PYRACANTHA ANGUSTIFOLIA.

South-western China.

ROSACEAE. Tribe POMEAE.

PYRACANTHA, *Roem.*; *C. K. Schneider in Handb. d. Laubholzk.* vol. i. p. 761.

Pyracantha angustifolia, *C. K. Schneider in Handb. d. Laubholzk.* vol. i. p. 761; a *P. coccinea*, Roem. (*Crataegus Pyracantha*, Med.), receptaculo calyceque extus cinereo-tomentoso et foliis lineari-oblongis integris differt.

Frutex divaricato-ramosus, ramulis primo magis minusve ochraceo-tomentosis anno secundo glabratis, cortice fusco-purpureo obtectis, rugoso-lenticellatis, nonnullis in spinas validas 0·5–1·5 cm. longas mutatis. *Folia* in brachycladiis et ad macrocladiorum bases fasciculatim congesta, persistentia, lineari-oblonga, obtusa, mucronulo imposito, basin versus magis minusve attenuata, margine recurvo integra vel hinc inde minutissime glanduloso-serrata, 2–6 cm. longa, 7–9 mm. lata, subcoriacea, supra nisi novella glabra, nitidula, infra griseo-tomentella indumento demum laxo vel fere evanido; nervi laterales tenues, utrinque circiter 8, supra impressi; petioli 3–10 mm. longi. *Corymbuli* pauciflori vel ad 15-flori quam folia breviores; pedunculi pedicellique cinereo-tomentosi. *Receptaculum* turbinatum, cinereo-tomentosum. *Sepala* late ovata, persistenter tomentosa, 1·5 mm. longa. *Petala* alba, suborbicularia. *Stamina* circiter 20. *Carpella* 5; styli 5. *Fructus* depresso-globosus, aurantiacus, glabratus, 6–8 mm. diametro, calyce persistente coronatus; pyrenae dorso inferne receptaculo adnatae caeterum liberae, receptaculo circumvallatae.—*Cotoneaster angustifolia*, Franch. Pl. Delav. p. 221.—O. STAPF.

The Chinese Thorn here figured is very closely allied to the European Everlasting Thorn and to its Himalayan representative the White Thorn of Nepal. A perplexing divergence of view has prevailed as to the taxonomic position and status of these three Thorns. The Everlasting Thorn or Buisson Ardent which, in 1753, Linnaeus named *Mespilus Pyracantha*, was, forty years later, treated by Medik as a *Crataegus* and, after a similar lapse of time, referred by Spach to *Cotoneaster*. The Nepalese White Thorn was in the first instance referred, in 1814, to *Crataegus*, by Roxburgh, as *C. crenulata*, but was treated by D. Don in 1825 as a *Mespilus*, and was only transferred, by Koch, to *Cotoneaster* as recently as 1869. The subject of our illustration, which was discovered by Delavay in Yunnan in 1882, was in the first instance referred by Franchet in 1889 to *Cotoneaster* as *C. angustifolia*. The agnomen "Pyra-

cantha" definitely associated by Linnaeus with the Buisson Ardent is believed to have been misapplied; it is generally held that the Pyracantha of Greek authors is our Hawthorn. Nevertheless the use of the name Pyracantha to connote the Everlasting Thorn has become popular; that plant is now, and bids fair to remain, the Pyracantha of gardens, which fails to appeal to the lay mind either as a *Crataegus* or as a *Cotoneaster*. In this case the popular instinct appears to be sound, for the suggestions made by Medik and by Spach, though more satisfactory than that of Linnaeus, are both more or less open to objection. Under the circumstances it seems desirable, and it certainly is more convenient, to adopt yet another suggestion, first made by Roemer in 1847, and recently endorsed by Schneider, and to treat the group of species to which our plant belongs as a genus *Pyracantha*, closely allied indeed both to *Crataegus* and to *Cotoneaster*, but equally distinct from either. *Pyracantha angustifolia* was first introduced to cultivation by Mr. M. L. de Vilmorin from seeds sent to Les Barres from Eastern Tibet by Soulié in 1895. A second set of plants was raised at Kew from seeds sent from Western China in 1899 by Lieut. Jones. The original plant at Les Barres bears plentiful crops of berries which in the late autumn develop a bright orange colour. At Kew, where *P. angustifolia* does well on a sunny wall, there is hardly sufficient sunshine to bring out its best qualities as a shrub, and in the open, although it survives the winter, it has not proved perfectly hardy. In the warmer conditions of South-western England it is more at home, and the material for an illustration has been obtained from a plant in fruit in the open in January, 1910, in the garden of Lieut.-Col. D. D. Cunningham at Tormount, Torquay; the flowering twig which completes our figure was supplied in July, 1910, from the same bush. The species is best propagated from cuttings of half ripened wood.

Description.—*Shrub*; branches spreading; twigs at first more or less yellow tomentose, in their second season glabrous, their bark tawny purple, rough with lenticels; occasionally some of the twigs modified into stout spines 3–8 lin. long. *Leaves* clustered on abbreviated twigs or at the bases of longer ones, persistent, linear-oblong, obtuse

with a slight mucro, more or less narrowed to the base, margin recurved, entire or here and there faintly glandular serrate, $\frac{3}{4}$–$2\frac{1}{4}$ in. long, 4–5 lin. wide, subcoriaceous, glabrous above except when young and somewhat polished, beneath clothed with a grey tomentum which becomes lax and almost disappears with age; lateral nerves slender, about 8 on each side, impressed above; petioles 2–5 lin. long. *Corymbs* rather few-flowered, shorter than the leaves; peduncles and pedicels grey pubescent. *Receptacle* turbinate, grey pubescent. *Sepals* wide ovate, persistently pubescent, 8 lin. long. *Petals* white, suborbicular. *Stamens* about 20. *Carpels* and styles 5. *Fruit* depressed-globose, orange-yellow, glabrate, 3–4 lin. long, tipped by the persistent calyx lobes; pyrenes adnate dorsally in their lower portion to the receptacle, otherwise free from though surrounded by the receptacle.

Fig. 1, part of a leaf; 2, a flower; 3, calyx, partly removed, showing stamens and pistil; 4, a carpel; 5, fruit in vertical section, showing pyrenes; 6, a pyrene; 7, the same in vertical section; 8, seed :—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks Day & Son

Tab. 8346.

HOULLETIA Sanderi.

Peru.

Orchidaceae. Tribe Vandeae.

Houlletia, *A. Brongn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 550; *Pfitzer in Engl. & Prantl Nat. Pflanzenf.* vol. ii. pars 6, p. 168.

Houlletia Sanderi, *Rolfe in Gard. Chron.* 1910, vol. xlvii. p. 206; *Orch. Rev.* 1910, p. 118; species *H. Lowianae*, Reichb. f. proxima, sed labelli lobis lateralibus falcato-oblongis et obtusis nec longe acuminatis distincta.

Herba epiphytica. *Pseudobulbi* conferti, ovoideo-oblongi, sulcati, 5–7 cm. longi, circiter 2 cm. lati, monophylli. *Folia* breviter petiolata, oblongo-lanceolata, acuta, subplicata, recurva, circiter 30 cm. longa, 4 cm. lata. *Scapus* erectus, 25–30 cm. alta, vaginis lanceolatis acutis obtectus, 2–3-florus. *Bracteae* lanceolatae, breviter acuminatae, nigro-punctatae, circiter 1·5 cm. longae. *Pedicelli* 3–4 cm. longi. *Flores* magni, straminei, inversi. *Sepala* subpatentia, valde concava, posticum late ellipticum, apiculatum, circiter 3 cm. longum; lateralia late ovata, apiculata, circiter 3 cm. longa. *Petala* suborbicularia, subconcava, circiter 3 cm. longa. *Labellum* profunde trilobum; lobi laterales late falcato-oblongi, apice obtusi vel rotundati et leviter recurvi, 1·5 cm. longi, medio transverse carinati, fronte in dente obtuso extensi; mesochilium oblongum, truncatum, 1 cm. longum, carnosum; epichilium obovato-oblongum, 1·5 cm. longum, apice denticulatum, basi cuneatum, submembranaceum. *Columna* clavata, arcuata, circiter 1·8 cm. longum; pollinia 2, cerea, ovoidea; stipes lineari-oblongus; glandula suborbicularis.—R. A. Rolfe.

Three members of the South American genus *Houlletia* have already been figured in this work: *H. Brocklehurstiana*, Lindl., a native of Brazil, at t. 4072; *H. picta*, Linden and Reichb. f., a native of Colombia, at t. 6305; and *H. Landsbergi*, Linden and Reichb. f., another Brazilian species, at t. 7362. The interesting species now depicted was imported from Peru by Messrs. Sander & Sons, St. Albans; there is an example of the species in the orchid collection at Kew. *H. Sanderi* flowered for the first time in Europe in January, 1910, in the nursery of Messrs. Sander & Sons at Bruges; our plate has been prepared from the specimen then sent to Kew for determination. It is most nearly allied to *H. Lowiana*, Reichb. f., another Colombian species, but differs considerably in the details of the lip, more especially in the very dissimilar side lobes. The Kew plant, which has not

yet flowered, thrives well under the treatment suitable for *Lycaste Skinneri*, Lindl., an orchid which is figured at t. 4445 of this work.

Description.—*Herb*; pseudobulbs close set, ovoid-oblong, furrowed, 2–2½ in. long, about ¾ in. thick, unifoliate. *Leaves* shortly petioled, oblong-lanceolate, acute, slightly plicate, recurved, about 12 in. long, 1½ in. wide. *Scape* erect, 10–12 in. long, 2–3-flowered, clothed with lanceolate acute sheaths; bracts lanceolate, shortly acuminate, black dotted, about 8 lin. long; pedicels 1¼–1½ in. long. *Flowers* large, pale yellow, inverted. *Sepals* somewhat spreading, very concave, apiculate, about 1¼ in. long, the posterior wide elliptic, the lateral pair wide ovate. *Petals* nearly orbicular, somewhat concave, about 1¼ in. long. *Lip* deeply 3-lobed; lateral lobes widely falcate-oblong, obtuse or rounded and slightly recurved at the tip, 8 lin. long, transversely keeled in the middle and prolonged in front in an obtuse tooth; mesochile oblong, truncate, 5 lin. long, fleshy; epichile obovate-oblong, 8 lin. long, with denticulate tip and cuneate base, nearly membranous. *Column* clavate, curved, about 9 lin. long; pollinia 2, ovoid, waxy; stalk linear-oblong; gland suborbicular.

Fig. 1, lip and column; 2, column seen from in front; 3, pollinia:—*all enlarged.*